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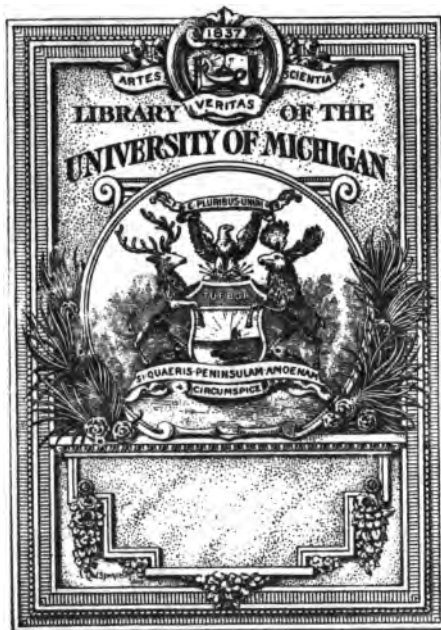
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University of Michigan - BUHR



Proceedings
of the
American Association
of Medical Milk
Commissions

Fifth Annual Conference
PHILADELPHIA, PA.
May, 1911



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PROCEEDINGS
OF THE
FIFTH ANNUAL
CONFERENCE
OF THE
AMERICAN ASSOCIATION
OF MEDICAL MILK
COMMISSIONS

Held at the

Bellevue-Stratford Hotel, Philadelphia, Pa.

Tuesday and Wednesday,
May 23 and 24, 1911.

CINCINNATI, OHIO
1911.

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OFFICERS 1911-1912.

PRESIDENT.

Dr. Henry Enos Tuley 111 W. Kentucky St., Louisville, Ky.

SECRETARY.

Dr. Otto P. Geier 124 Garfield Place, Cincinnati, Ohio.

TREASURER.

Dr. Samuel McC. Hamill 1822 Spruce St., Philadelphia, Pa.

COUNCIL.

Dr. I. A. Abt, Chairman 100 State St., Chicago, Ill.
Dr. Otto P. Geier, Secretary 124 Garfield Place, Cincinnati, Ohio.
Dr. Henry L. Coit 277 Mt. Prospect Ave., Newark, N. J.
Dr. John W. Kerr Washington, D. C.
Dr. Ogden M. Edwards, Jr. 5607 Fifth Ave., Pittsburgh, Pa.
Dr. J. J. Thomas 1110 Euclid Ave., Cleveland, Ohio.
Dr. Henry Enos Tuley Louisville, Ky.
Dr. Samuel McC. Hamill Philadelphia, Pa.

STANDING COMMITTEES.

Medical Examinations of Employees.

Dr. W. H. Park, New York City.	Dr. M. J. Rosenau, Boston, Mass.
Dr. Thomas Harvey, Orange, N. J.	Dr. Alfred Hand, Philadelphia, Pa.

Chemical Standards.

Dr. L. L. Van Slyke, Geneva, N. Y.	Dr. Henry Dwight Chapin, New York City.
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Bacteriological Standards.

Dr. M. J. Rosenau, Boston, Mass.	Dr. W. H. Park, New York City.
Mr. H. A. Harding, N. Y. State Exp. Sta., Geneva, N. Y.	Dr. M. P. Ravenel, University of Wisconsin, Madison, Wis.
Dr. Rowland G. Freeman, New York City.	Dr. Francis H. Slack, Boston Mass.
Prof. W. A. Stocking, Jr., Cornell University, Ithaca, N. Y.	Prof. A. R. Ward, Manila, P. I.

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STANDING COMMITTEES.—Continued.

Veterinary Inspections and Protection Against Tuberculosis.

Dr. Samuel McC. Hamill, Prof. A. R. Ward.

Statistics of Milk-borne Morbidity and Mortality, and Infants' Milk Charities.

Dr. Henry L. Coit, Chairman, Newark, N. J.

Dr. John W. Kerr, Washington, D. C.

Dr. Rowland G. Freeman, New York City, N. Y.

COMMITTEE OF COUNCIL.

On Publication.

Dr. Henry L. Coit.

Dr. Henry Enos Tuley.

Dr. Otto P. Geier.

PROGRAM.

FIRST SESSION.

Tuesday Morning, May 23—10 A. M.

A Word of Welcome.....BY THE PRESIDENT.

Roll Call of Commissions and Members.

Reading of Communications.....BY THE SECRETARY.

Report of the Council on Newly Elected Commissions, Members, and Guests.

Commission Reports of Their Local Work. (Limited to 10 minutes.)

"The Limitations of Certified Milk,"..CHAS. E. NORTH, M. D., New York City.

"The Importance of a *Certified* Butter Supply,"

ALFRED HESS, M. D., New York City.

"A Newspaper's Investigation of Milk Conditions in a Large City,"

MR. CONRAD HANEY, Editorial Staff Newark (N. J.) *Evening News*.

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SECOND SESSION.

Tuesday, May 23—2 P. M.

JOINT SESSION.

**THE AMERICAN ASSOCIATION OF MEDICAL MILK COMMISSIONS
AND**

THE CERTIFIED MILK PRODUCERS' ASSOCIATION OF AMERICA

GENERAL TOPIC.

"The Milk Commission as a Factor in a Clean Milk Supply."

Relations Between Certified Milk and Market Milk.

The Certified Label—Its Use and Abuse.

Qualifications of a Milk Commissioner.

Cost of Certification.

Standards and Supervision.

Co-operation Between Boards of Health and Milk Commissions.

THIRD SESSION.

Wednesday, May 24—10 A. M.

Business requiring early attention.

"A History of the Control of Tuberculosis in Certified Herds,"

GEO. S. BAKER, M. D., San Francisco, Cal.

"The Future Milk Supply of New York City,"

WM. H. PARK, M. D., New York City.

"The Present and Future of *Certified* Milk from a Large Dealer's Point of View,"

C. N. DAVIS, M. D., Philadelphia, Pa.

"A Scheme for Organization and Control of the Milk in Small Communities,"

PROF. H. W. CONN, Middletown, Conn.

**"Remarks on the Forward Movement of the American Association of Medical
Milk Commissions".....HENRY L. CORT, M. D., Newark, N. J.**

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FOURTH SESSION.

Wednesday, May 24—2 P. M.

Address of the President.....M. J. ROSENAU, M. D., Boston, Mass.

“Microscopic Test for Heated Milk,”

M. P. RAVENEL, M. D., and W. D. FROST, M. D., University of Wisconsin,
Madison, Wis.

“Milk as a Carrier of Infection,”

E. C. SCHROEDER, M. D., Superintendent of Experiment Station, U. S. Dept.
of Agriculture, Bethesda, Md.

“The Work of the Mayor’s Milk Commission of Philadelphia and Its Probable
Effect Upon the Milk Situation,”

SAMUEL McC. HAMILL, M. D., Philadelphia, Pa.

“Four Years of Dairy Inspection in Richmond, Virginia,”

E. C. LEVY, M. D., Richmond, Va.

“Data Regarding Operations of Infants’ Milk Depots in the United States
During 1910”.....JOHN W. KERB, M. D., Washington, D. C.

SPECIAL ANNOUNCEMENT.

HEALTH OFFICERS’ DAY.

Thursday, May 25.

The attention of the members of the Association is especially drawn to the following announcement:

On Thursday, May 25th, the day immediately following the final sessions of our meeting, there will be held at the Bellevue-Stratford Hotel, under the direction of the Bureau of Health of the City of Philadelphia, a conference of State and Municipal Health Officers. There will be morning and afternoon sessions. The report of the Milk Commission appointed by the Mayor of Philadelphia will be offered as a text for the discussion. This will give opportunity for a broad discussion of the many problems concerned in the Municipal control of milk supplies. Members of Milk Commissions by thoroughly understanding Municipal milk problems can make themselves more useful to their communities.

You are earnestly requested to attend!

SESSIONS: 10 A. M.—12 M.

2 P. M.—5 P. M.

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LECTURE SCHEDULE FOR PHILADELPHIA MILK SHOW.

Saturday, May 20, 1911.

3 P. M.

Presiding Officer: HON. JOHN K. TENER, Governor of the State of Pennsylvania.

Speakers: HON. JOHN E. REYBURN, Mayor of the City of Philadelphia—*Address of Welcome.*

DR. JOSEPH NEFF, Director of the Department of Public Health and Charities—*The Present Condition of Philadelphia's Milk Supply.*

8 P. M.

Presiding Officer: DR. WARD BRINTON.

Speakers: DR. R. A. ROSENBERGER, Prof. Bacteriology, Jefferson Medical College—*The Dissemination of Disease by Milk.*

DR. L. F. FLICK, Director of the White Haven Sanatorium—*Milk as a Food.*

DR. J. C. GITTINGS, Visiting Physician to the Children's Hospital—*The Hours of Delivery of Milk to the Consumer and the Care of the Empty Milk Bottle.*

Sunday, May 21, 1911.

3 P. M.

Addresses in Yiddish.

Presiding Officer: DR. L. W. STEINBACH, Professor of Surgery, Polyclinic Hospital and School for Post-graduates.

Speakers: DR. MAURICE GOLDBERG, Member of the Philadelphia Pediatric Society—*Infant Mortality and the Milk Question.*

DR. SEILOKOWITCH, Member of the Philadelphia Pediatric Society—*Care of Milk in the Home.*

8 P. M.

Presiding Officer: DR. JAMES M. ANDERS, Professor of Medicine, Medico-Chirurgical College.

Speakers: DR. JAMES H. MCKEE, Professor of Diseases of Children, Temple University—*The Value of Milk to the Indoor Worker.*

DR. JESSE D. BURKS, Director of the Bureau of Municipal Research—*Milk Products in Relation to Health.*

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Monday, May 22, 1911.

3 P. M.

Presiding Officer: DR. D. J. MILTON MILLER, Member of the American Pediatric Society.

Speakers: DR. HENRY L. COIT, President of the New Jersey State Pediatric Society—*The Medical Milk Commission and Its Purposes.*

MR. W. E. MILLER, President of the Certified Milk Producers' Association of America—*Dairy Education Amongst the Producers of Milk.*

8 P. M.

Presiding Officer: DR. J. T. RUGH, President of the Philadelphia Pediatric Society.

Speakers: DR. ABRAHAM JACOBI, Emeritus Professor Diseases of Children, Columbia University—*The Diseases of Children Traceable to Bad Milk.*

MR. STEPHEN FRANCISCO, Former President of the Certified Milk Producers' Association of America—*The Production of Clean Raw Milk.*

Tuesday, May 23, 1911.

3 P. M.

Presiding Officer: DR. JAMES TYSON, Emeritus Professor of Medicine, University of Pennsylvania.

Speakers: DR. G. M. WHITAKER, in Charge of Work Relating to Market Milk, B. A. I., Department of Agriculture—*The Care of Milk in the Home.*

DR. ALFRED HESS, New York Department of Health—*The Necessity of Proper Control of the Manufacture of Butter.*

8 P. M.

Presiding Officer: MR. J. PRENTISS MURPHY.

Speakers: DR. H. W. CONN, Professor of Bacteriology, Wesleyan University—*Milk Supplies of Villages.*

DR. W. H. PARK—*The Relationship of Milk to Tuberculosis in Human Beings.*

Wednesday, May 24, 1911.

3 P. M.

Presiding Officer: DR. J. C. WILSON, Professor of Medicine, Jefferson Medical College.

Speakers: DR. E. C. SCHROEDER, Superintendent Experiment Station, B. A. I., Department of Agriculture—*Milk as a Carrier of Infection.*

DR. JOHN R. MOHLER, Chief of the Pathological Division, B. A. I., Department of Agriculture—*Methods of Protecting Milk Supplies from Sources of Infection.*

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8 P. M.

Presiding Officer: DR. R. H. HARTE, Surgeon to the Pennsylvania Hospital.

Speakers: DR. M. J. ROSENAU, Professor of Preventive Medicine, Harvard University—*Pasteurization of Milk.*

DR. W. A. EVANS, Health Officer, City of Chicago—*Safeguarding the Handling and Distribution of Milk in Cities.*

Thursday, May 25, 1911.

3 P. M.

Presiding Officer: DR. SAMUEL G. DIXON, Commissioner of Health, State of Pennsylvania.

Speakers: DR. G. M. WHITAKER, in Charge of Work Relating to Market Milk, B. A. I., Department of Agriculture—*Means of Improving Market Milk as Carried Out by the Dairy Division, Department of Agriculture.*

DR. J. P. TURNER, Chief Milk Inspector, Washington, D. C.—*The Inspection of Dairy Herds; What the Inspector Does and Why He Does It.*

8 P. M.

Presiding Officer: REV. HERMAN L. DUHRING, Superintendent of City Missions.

Speakers: DR. D. L. EDSALL, Professor of Medicine, University of Pennsylvania—*The Relative Value of Milk and Other Foods, Especially the Advertised Substitutes for Milk.*

DR. JOHN AMYOT, Health Officer, City of Toronto, Canada—*What the Consumer Should Demand of the Milkman.*

Friday, May 26, 1911.

3 P. M.

Presiding Officer: DR. E. E. GRAHAM, Professor Diseases of Children, Jefferson Medical College.

Speakers: DR. GEO. W. STILES, Chief Bacteriologist, Bureau of Chemistry, Department of Agriculture—*Ice Cream and Its Relation to Public Health.*

DR. WOODS HUTCHINSON, New York—*The Deceptions Practiced in the Preparation and Sale of Milk.*

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8 P. M.

Presiding Officer: DR. JOSEPH S. NEFF, Director of the Department of Public Health and Charities.

Speakers: MRS. WILLIAM LOWELL PUTNAM, Chairman Executive Committee, Massachusetts Milk Consumers' Association—*Consumers' Organizations in Relation to the Milk Question.*

DR. OTTO P. GEIER, Secretary of the American Association of Medical Milk Commissions—*Dangerous Practices in the Handling of Milk.*

Saturday, May 27, 1911.

3 P. M.

Presiding Officer: MR. W. T. PHILLIPS, of the Tristate Milk Producers' Association.

Speakers: DR. G. M. WHITAKER, in Charge of Work Relating to Market Milk, B. A. I., Department of Agriculture—*How to Produce High-Scoring Milk.*

DR. C. J. MARSHALL, Veterinarian of the State of Pennsylvania—*Inspection of Dairy Herds as Installed by the State Live Stock Sanitary Board.*

AWARDING OF PRIZES IN THE MILK CONTEST.

8 P. M.

Closing Session—Summing Up the Lessons of the Week.

Presiding Officer: MR. J. A. VOGELSEN, Chief of the Bureau of Health, Philadelphia.

Speakers: MR. JOHN D. NICHOLS, President of the International Milk Dealers' Association—*The Journey of Milk from the Cow to the Consumer.*

DR. TALCOTT WILLIAMS—*The Duty of the Public in the Crusade for Clean Milk.*

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FIRST SESSION.

Tuesday Morning, May 23, 1911.

The meeting was called to order at 10.30 o'clock, President Rosenau in the chair.

President Rosenau, in addressing the Association of Commissions, introduced Dr. Joseph S. Neff, Director of the Bureau of Public Health and Charities of the city of Philadelphia, and asked Dr. Neff to make the address of welcome to the meeting, to which Dr. Neff complied, as follows:

"I notice by the program that your president is announced to deliver the introductory address, and it appears somewhat strange to have him call upon me, without a moment's notice, to perform functions that he is in every manner better fitted to perform than I. If it was the intention of your Committee on Arrangements to have a few words of welcome expressed by a city official, the mayor should have been invited to perform that pleasant duty, especially as he is interested in the subject matter to be brought before your meeting; is a man of large heart, and is particularly apt in extending the hospitality of Philadelphia to strangers coming into our midst. I would say, for him, that Philadelphia is honored in having the conference here, as the benefit to be derived from your discussions, although widespread, will be of the greatest value to Philadelphia.

"Conferences of this character always bring up new subjects, and the interchange of opinions by a body of scientific men is productive of great good, much information is derived, and we will return to our homes better fitted to render more efficient service in the localities in which we live.

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"During your sojourn in the City of Brotherly Love you are welcome, and if there should be anything you want or anything you don't want, register your desires with the secretary, and your wishes will be met. Philadelphia has the reputation of having one of the best police forces in the United States, and should you get into any trouble of any character, as medical men are apt to do when they get away from home, we will forget for the three days you are here this great reputation, and have the eyes of the police blinded and their ears deafened so that they will neither see nor hear anything culpable in the individuals representing the Associations of Medical Milk Commissions.

"I will constitute myself a bureau of information for your benefit, and can be reached at the City Hall any time by telephone."

COMMISSION REPORTS.

Ogden M. Edwards, Jr., M. D., of Pittsburgh, Pa., made the following report of the Milk Commission of the Allegheny County Medical Society, Pittsburgh, Pa.:

"I came here unprepared to give any report, but possibly I should say a few words with reference to the work which we are doing in Pittsburgh.

"The Commission has been certifying milk for some years, and is now organized on a good business foundation. We are certifying milk from three dairies. The money which we derived from selling seals to these dairies has put us on a firm financial basis, so we are paying our own expenses and going ahead.

"We have nothing of special interest to say except this, which may be of interest to you, and that is, we hope, when we have enough money in our treasury, to build a milk research laboratory where milk will be studied, where the routine work of examining our Certified Milk may be carried out, and where all questions with reference to milk in Pittsburgh may be answered, if possible. We want to make it a place where physicians may bring milk for examination, and where they may have questions answered with regard to milk."

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Ben Carlos Frazier, M. D., of Louisville, Ky., made the following report of the Milk Commission of the Jefferson County Medical Society, Louisville, Ky.:

"Mr. President and Gentlemen,—Each year the work of the secretary and the Commission as a whole has become more and more laborious, not only on account of the natural growth of the production of Certified Milk, and the distribution thereof, but because of the fact that the Commission has tried to make the rules governing the production of Certified Milk more stringent, and it takes constant supervision over a large number of dairymen to keep things running in the prescribed order. We have had perhaps more trouble in the last twelve months than ever before in the management and production of Certified Milk. We had an outbreak of diphtheria in the family of a dairyman furnishing inspected milk, and we discontinued the supply at once. Our chairman visited the dairy and met the doctor in attendance, and the supply was not resumed until we had a certificate from the attending physician stating that the case was well and that some weeks had elapsed since the recovery of the child and that there had been no further outbreak, and that all necessary fumigation and sterilization of the premises had been duly and conscientiously done. We also had an outbreak of measles in the family of the proprietor of Dairy No. 1, and we discontinued the milk from the dairy, although we had no precedent for doing such a thing, as we knew of no case in which measles had been carried by milk nor could we hear of any case where measles had been borne by milk. We discontinued this milk because we did not want to be criticised in the possible event there should be an outbreak in any of the families that were receiving milk from this dairy, and subsequent to this one of the dairies that was furnishing Certified Milk ran such a high count persistently that we had to discontinue the delivery of this milk and it was some weeks before he was allowed to resume, and, in fact, not until he had furnished three weekly reports that showed a count less than 10,000 per cc. The trouble was found to be in inefficient sterilization, and since

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his sterilizing plant has been improved he has not had a single high count in several months. Just here we would like to go on record that it is lack of proper sterilization more often than anything else that has given high counts. We are sure, too, that poor washing of the teats—that is to say, washing and poor drying—is a frequent cause of a high count. We have also been led to believe that winter high counts are due frequently to muddy feet and tails. We have concrete walkways all around four or five of the seven certified dairies that we have under supervision; the two others have concrete driveways approaching the dairy barns, which is a great help in keeping out mud tracked into the barn. The dairymen are conscientious in trying to keep down to a low count, and it is only the lack of team work that occasionally gives trouble so far as the milkers and helpers are concerned; that is to say, where a new man has been taken on that has not been properly trained.

“Our inspections have been made by some member of the Commission, the veterinarian or the bacteriologist, regularly, but just recently we asked, as a special check, Mr. R. M. Allen, of the Pure Food Division and Experimental Station of the State, to make an inspection of our dairies and to score them and to take milk samples, all of which he kindly did, and I have herewith his report, which I am anxious to have incorporated in my annual report. The Commission feels justly proud of the results of this scoring and bacterial count, which we believe will compare favorably with the Certified Milk produced any place in the country.

“We have also made application to the Bureau of Animal Industry for a veterinarian of the department to make tuberculin tests of all the cows that had not been tested in a year. The regular blank being used by the Department for this work was so lenient in regard to slaughter of animals which had reacted to the test and other points, that the Commission asked for a special blank, and this request has been granted. We have also gotten up a special form, with the assistance of Dr. Burneson, of the Department, and we think this chart is an improvement on any other that we have seen. We have

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arranged for a drawing showing the right and left side of the cow and its face, and a place for the history, temperature, the inspector's name, remarks, etc. We will from this time on have a card for each cow, and from year to year these cows' records as to temperature, etc., will be kept by the secretary. We have had some trouble in regard to identification marks heretofore, hence this special chart card. I will pass around the copy of this card so the gentlemen can understand it more fully than from the description.

"Burneson is now making tests, and we have been gratified from year to year not to find a reacting cow that had failed to react at a previous test. We have several dairymen who are breeders of registered Jerseys, and it is gratifying to them, as many of these cows are very valuable, some of the cows' values running into thousands of dollars. We have continued the same method of delivery—that is, one distributor who buys the milk outright from the dairymen and delivers in the city. The Commission, of course, has the same supervision over the distributor as we have over the producers. The Baby's Milk Fund Association continues to grow, and the Neill Roach Dairy Company, our distributor, modifies the milk for the Baby's Milk Fund Association, and he also modifies for the doctor's private prescription.

"Dr. Burneson, of the Government Animal Bureau, finished his test of 265 cows under our Commission, and found one tubercular cow:

The Neill Roach Dairy Company, 1152 Sixth St., Louisville, Ky.
Samples taken on April 28, 1911, by J. W. McFarlin and W. R. Pinnell.

No.		Bacteria per c. c.
540.	"Certified Sweet Milk," G. M. Fenley, dairyman.....	1,000
541.	"Certified Cream," G. M. Fenley, dairyman.....	500
542.	"Certified Sweet Milk," B. McClaskey, dairyman.....	1,000
543.	"Certified Cream," B. McClaskey, dairyman.....	9,000
544.	"Certified Sweet Milk," J. L. Shallcross, dairyman.....	3,000
545.	"Certified Cream," J. L. Shallcross, dairyman.....	1,500
546.	"Certified Sweet Milk," J. A. Rodman, dairyman.....	1,500
547.	"Certified Cream," J. A. Rodman, dairyman.....	7,000
548.	"Certified Sweet Milk," F. C. Dickson, dairyman.....	5,000
549.	"Certified Sweet Milk," Nichols Bros., dairymen.....	4,000
550.	"Certified Cream," Nichols Bros., dairymen.....	5,000
551.	"Certified Sweet Milk," W. S. Parker, Jr., dairyman.....	4,500
552.	"Certified Cream," W. S. Parker, Jr., dairyman.....	2,000

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Mr. J. L. Shallcross, Anchorage, Ky.

Samples taken on April 28, 1911, by J. W. McFarlin and W. R. Pinnell.

No.	Bacteria per c. c.
553. Milk from cow No. 8 at beginning of milking.....	2,450
554. Milk from cow No. 41 just as she was being finished milking, less than..... (The dilution used was 1-50, and there were no colonies on the plates.)	50
555. Milk from bucket just opened, from cow No. 8.....	1,300
556. Cream from bucket under separator.....	3,100
557. Cream from stream coming out of separator.....	2,050
558. Cream from stream running from cooler or aerator. Cooler is enclosed; stream just outside.....	2,300
559. Cream, sample from bottling tank.....	1,950
560. Milk from bucket, from cow No. 28, just after weighing..	2,050

Mr. Benjamin McClaskey, Louisville, Ky., R. R. No. 3.

Samples taken on April 29, 1911, by R. M. Allen.

No.	Bacteria per c. c.
1020. Milk taken from end of milking, washed teat..... (A new barn and dairy room, some mud on cemented barn floor, due to cows coming from muddy lot.)	550
1021. Milk of one cow taken from bucket.....	1,550
1022. Milk from Roan cow, first stream, udders washed and dried	2,200
1023. Milk from bucket, three cows.....	2,950
1024. Milk, same as No. 1023, from cooler, temperature 54°....	4,500
1025. Cream from separator..... (Sanitary condition of separator room good; milk goes into room through funnel and wall tube.)	22,500
1026. Milk from separator, skimmed; same as No. 1025 sanitary condition	28,000

Mr. G. M. Fenley, Louisville, Ky., Fenley Sta.

Samples taken on April 28, 1911, by R. M. Allen.

No.	Bacteria per c. c.
1013 (1). Milk from teat, first stream, washed teat..... (Very good sanitary condition, certified dairy; personal care of proprietor in barn, and his wife in milk house.)	100
1014 (2). Milk from middle run of teat.....	100
1015 (3). Milk from bucket, three cows.....	550
1016 (4). Milk from cooler.....	6,350
1017 (5). Milk from first stream, washed teat.....	150
1017 (6). Milk from middle run, same cow as No. 1016.....	100
1018 (7). Milk from unwashed teat, which was dry but not dirty	50
1019 (8). Milk from another teat of same cow as No. 1018 (7), after washing	6,650
(Teat washed, but not dried thoroughly.)	

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Mr. W. S. Parker, Jr., Louisville, Ky., Ormsby Sta.

Samples taken on April 28, 1911, by John W. McFarlin and W. R. Pinnell.

No.		Bacteria per c. c.
561.	Milk from cow No. 7 (Iola Fox), while being milked; milked from cow into tube; at the beginning.....	1,050
562.	Broken.	
563.	Milk from cow No. 4, Queen, first milk.....	200
564.	Milk from bucket of milk from cow No. 4, Queen.....	1,100
565.	Cream taken while running from separator.....	2,500
566.	Cream taken from bucket under separator.....	4,400
567.	Cream taken from stream running from cooler.....	700
568.	Cream taken from bottle just filled from bottling tank...	3,800

Mr. F. C. Dickson, Tip Top, Ky.

Samples taken on April 29, 1911, by J. W. McFarlin and W. R. Pinnell.

No.		Bacteria per c. c.
569.	Sweet Milk, taken from cow, "Kentucky Belle," and Ayrshire, red and white spotted, before udders were washed; first milk	600
570.	Sweet Milk, taken from same cow as No. 569; first milk after udders were washed.....less than (The dilution was 1-50, and there were no colonies on the plate.)	50
571.	Sweet Milk, taken from bucket of milk from same cow as samples Nos. 569 and 570, at the conclusion of milking.	2,500
572.	Sweet Milk, taken from cow at conclusion of milking; cow, "Diner," a yellowish color.....	150
573.	Sweet Milk, taken from stream running from cooler; a mixture of three cows' milk.....	2,750

George F. Little, M. D., of Brooklyn, N. Y., offered the following report of the Milk Commission of the Medical Society of the County of Kings, Brooklyn, N. Y.:

"The Milk Commission of the County of Kings, State of New York, is able to report a successful year in the work. Thirteen dealers, supplied through ten farms, disposed of 1,083,195 bottles of Certified Milk in 1910—an average of 90,266 per month. It is possibly interesting to note that the highest output was in the month of December—103,424 bottles; the lowest in February—79,750.

"The limit of 10,000 bacteria in the c. c. is still maintained, and the average count of all the specimens examined during the year was 3,770. Seven hundred and twenty microscopic and chemical examinations were made upon samples a large number of which were purchased in open market.

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An average fat content of 4.77% is recorded. One farm averaged 5.30%, which was the highest, the lowest average being 4.28%. Inspections of farms were made on eighty-six different occasions by the bacteriologist and chemist of the Commission.

"It was considered that the ordinary method of sealing with interior cap and paraffin did not give sufficient protection to the lip of the bottle, which might carry dirt and its accompanying micro-organisms. The Commission has, therefore, with the very willing co-operation on the part of the dealers, added an outside cap held in place by a metal ring. This cap, in addition to showing the certification and name of the dealer, gives for identification the initial letter of the name of the farm.

"The matter of printing upon the cap the day of the month on which the bottle should be sold seemed to work considerable hardship to the dealers, requiring a separate set of caps for every day in the year. A committee for the Commission, acting with representatives from New York County, recently prevailed upon the Commissioner of Public Health to modify his order in this respect, the date being replaced by the day of the week. It is apparent that no dealer could hold milk capped to be sold on Wednesday, for example, until the same day of the following week. The present method, therefore, is less complicated and expensive and equally effective.

"This Commission has felt that, while the work is good and to a degree satisfactory, our colleagues of the profession do not always bear in mind the prime necessity of a pure milk, especially in the feeding of infants and young children. It is apparent also that the majority of the public are not sufficiently educated to demand what is within their reach. The higher price of Certified Milk may, among the poorer classes, fairly be a deterrent to its purchase. There are still many thousands of families who could afford pure milk if its advantages were known.

"Certified Milk is not well advertised—it should be. This Commission has authorized the issuance of a circular by the dealers, setting forth the method of preparation, handling, etc.,

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of the milk which bears our seal. The Commission feels that such propaganda will result in the betterment of the public health, and in the reduction of infant mortality. The dealers, with motives probably not quite so altruistic, have shown interest, and during the past month have had printed some 35,000 of these pamphlets. A copy will be filed with this report for possible publication in the journal of proceedings, as of interest to sister Commissions."

A. F. Furrer, M. D., of Cleveland, Ohio, made the following report of the Milk Commission of the City of Cleveland, Ohio:

"Mr. President, this is a short report of the Milk Commission of the City of Cleveland. We are certifying the milk of one dairy, which has a production of about eight hundred quarts per day. The counts of the milk are running quite low, and while the demand for certified milk is not very great, we have no difficulty in disposing of the quantity produced."

J. R. Williams, M. D., of Rochester, New York, made the following report of the Milk Commission of the Monroe County Medical Society, Rochester, N. Y.:

"At the present time our Commission is certifying the production of five dairies. Our daily output amounts to about 1,300 quarts.

"We have n't anything particularly interesting or new, excepting that we have inaugurated a movement that is somewhat unique. We are about to organize a dairy school in connection with our Commission, for training employees for milk farms. We expect to give an elemental course in dairy science, as one of the greatest difficulties we have had so far is to secure trained workers on our dairy farms."

Dr. B. L. Arms, of Boston, Mass., read the report of the Milk Commission of the Suffolk District Medical Society, Boston, Mass.:

"Since the last meeting of the Association the personnel of the Commission has been changed somewhat, and the mem-

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bership is now composed of two men in general medical practice, an obstetrician, a bacteriologist, and two pediatricians. No new farms have been added to our list of those certified, but the proprietor of one of the farms is now constructing a new barn preparatory to certification of another dairy. We are certifying the milk from four dairies. Two of these deliver their own milk, and the other two deliver through two of the large milk dealers in the city. This second method seems to have a certain advantage, in that it puts the certified milk within very easy access of a large territory. The farms are producing about 1,800 quarts of milk daily, most of which is sold.

"The Commission has been able to continue the arrangement of previous years for free bacteriological and chemical analysis of the milk, and for veterinary and medical inspection of the farms.

"We have allowed the farms who wish to adopt a cap made by the Standard Cap and Seal Company in Chicago, for sealing the bottles, on top of which is stamped the seal of our certification. This does away with the additional expense of including the certificate in the bottle.

"We have been interested in furthering a bill before the Massachusetts Legislature for incorporation of medical milk commissions. Unfortunately, word has just come that the governor has vetoed the bill, which has passed both houses.

"There have been no striking innovations or extensions in the work of the Commission. The routine work of examining the farms and the milk has on the whole revealed a very satisfactory condition. The chemical analyses of the milk have remained remarkably constant throughout the year, and the bacteriological counts have been low, except for isolated instances where the count was above the standard for a short period.

"We have found a spirit of very willing co-operation among the milk producers. They have been ready at all times to meet our suggestions, and have tried to produce a milk supply which is as nearly perfect as possible.

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"The expenses of the Commission have been met as in previous years, by an appropriation from the Suffolk District Medical Society. It requires somewhat less than two hundred dollars a year to provide for the certification of the four farms."

Dr. George S. Baker, of San Francisco, Cal., reported for two Commissions, the San Francisco Commission and the Alameda County Commission:

"Before I begin my report, I want to put myself right with the meeting, who have me down on the programme as being an M. D. I haven't the honor of being an M. D. I have what I believe is a higher honor, that of being a Veterinarian.

"I will report for two Commissions, the San Francisco Commission and the Alameda County Association, the Alameda County Commission being the successor of the original Certified Milk Commission of the Oakland Home Club.

"The Oakland Home Club, being the Woman's Club of Oakland, California, realized the necessity of a better milk supply for their babies, and they started an investigation, which resulted in the organization of a Milk Commission headed by a doctor. There are four dairies supplying Certified Milk to the Bay District. There are three of the dairies whose product is certified to by both the Commissions, and up to the present time the work has been very largely duplicated by the two Commissions, through the lack of proper co-operation. Arrangements are in progress now which will result in clearing up the work and distributing the responsibility between the two Commissions. Inspections are made monthly by some member of the Commission in addition to the other inspections which are made by experts. The San Francisco Commission has made a practice of visiting every dairy before certifying to the product. The cost of this has been charged against the producer, as well as the expense of the preliminary tuberculin test.

"One of our producers is selling milk to the dining car service of the Southern Pacific. It is being served to customers on the dining car, in the original unopened bottle, and is selling at the table for fifteen cents a pint. For this he is using

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the standard cap. All the other milk is capped with the paraffine cap, and the certification of the Commission put over that and fastened with a rubber band.

"We have had more trouble with the distributors than along any other line. Very few of our producers are distributors; in fact, only one of them is distributing his own milk. They sell their milk to outside distributors, and there has been some little difficulty in controlling these distributors. The San Francisco Commission, a short time ago, received a great many complaints about the milk being warm, old, and generally unsatisfactory. They started an investigation of the distributors' methods, and notified the producer that a certain distributor would not be allowed to handle his milk any more. This action caused some disturbance, but the matter was finally adjusted satisfactorily, and there has been very little difficulty since.

"The eastern cities of the Bay District had some difficulty in distributing, but they have adopted a plan recently, which they think is going to work out very satisfactorily.

"The members of the Commission, and the other medical men in their travels around the different cities, make a practice of stopping milk wagons and examining the condition of the Certified Milk on the wagons. If they find a box, or a single bottle of Certified Milk on the wagon, that is not properly iced, they take off the certificate, use a blue pencil to cancel the cap, and turn it back to the driver. This effectually prevents the delivery of improper milk to the consumer. In order to identify themselves to the driver, they have adopted a button, a little bit larger than this one we have on to-day, reading, "Alameda County Medical Milk Commission," and by showing this to the driver, we have so far had no difficulty at all.

"We have a financial standing out there that we are proud of. The Alameda Commission charges the expense of their bacteriological and chemical examinations to the dairy, the Commission acting as collector for the dairyman. They get duplicate bills, the dairyman pays the bill to the Commission, and the Commission pays the expert. The expert's receipted

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bill is sent back to the Commission, it is recorded on the duplicate, and returned to the dairyman. The certificates have been sold for \$1.25 per thousand, but recently this was reduced to \$1.00 per thousand.

"We have so managed our affairs that we have a surplus in the treasury at the present time. We have adopted a system of paying all expenses and charging the producers \$3.00 per thousand for the certificates. The compensation to the experts was raised from fifty cents per head for testing, which was the price at which they started, to \$1.00 per head, and the traveling expenses of the expert were paid. This worked very nicely for about a year, when a small dairy came under certification, and the Commission immediately realized that the large dairy was paying a large part of the expenses for the certifying of the smaller dairy, which, of course, was unfair to the big man. They just recently had a couple of joint meetings with the Alameda Commission, and are just about prepared to change the method again, adopting the Alameda Commission plan.

"The bacteriological counts and the chemical analyses have given practically no difficulty at all. The experts and veterinarians have been connected from the start of the movement with the State University. They have been particularly fortunate in that respect. During the first few years Dr. A. R. Ward, State Bacteriologist, made expert examinations of the certified dairies, and did a great deal of work for the Commission. Since Dr. Ward has gone to Manila, Dr. Roadhouse has been doing this work.* Dr. Roadhouse is an ex-employee of the United States Bureau of Animal Industry.

"We did have some difficulty with one dairy, which was composed of mixed cows, Holsteins, Durhams, and Jerseys. The producer, being an artistic sort of chap, arranged his cows in an artistic manner. The reds were all together, the blacks were all together, and the whites were altogether. The result of this was that his milk would run very irregularly. At one time he would get a milk that would run very well in fat. The next time he would collect a sample it would run so low that it was finally decided he would have to change his plan. The

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producer was notified that he would have to violate his artistic taste and fix up the trouble, which he did. The cows were mixed together, and since this time there has been no trouble."

Henry L. Coit, M. D., of Newark, N. J., made the following report for the Essex County Medical Milk Commission, of Newark, N. J.:

"I did n't expect to make a report for our Commission, but the member, who was to have given this report, has not arrived. I wish to state in a few words, that the Essex County Medical Milk Commission is still in existence, and is doing its best to extend its work. We have not done anything startling during the past year.

"The report of our Commission, which was to have been here, has been delayed on account of the failure of the printer to have it finished, but I have his promise that the copies of our report for the past year will be sent to me by express to-night.

"One little incident occurred this year, which I am proud to report, not that the Commission was responsible, nor did the Commission take the initial step toward this, but the leading Newark evening newspaper took the step, and opened up a milk inquiry. This is the first inquiry of this kind with which I am acquainted, because this newspaper simply gave the editor *carte blanche* to spend all the money he wanted in looking up milk conditions in our city and suburbs, so this paper has published in the last four or five months some thirty or forty leading articles, which have opened the eyes of the public to the conditions that exist there, which were almost, if not as bad, as the conditions which Dr. Geier found in Cincinnati. The assistant editor is here, and later we are going to hear the story of this crusade."

Charles J. Hastings, M. D., Medical Health Officer of Toronto, Canada, made the following report for the Milk Commission of the Canadian Medical Association:

"The Milk Commission of the Canadian Medical Association has been in existence for over three years. During that

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time it has covered the entire Dominion of Canada. We have organized branch Commissions in all the large cities. Our methods are more comprehensive than those of some of the older Commissions. Previous to this the work of the Medical Milk Commission had practically been limited to Certified Milk. The Canadian Medical Association Milk Commission realized the importance of fixed standards for Certified Milk, but they also realized that it was impractical for some time to come to have the entire milk consumption of any municipality reach that standard. In view of the fact of the dangers of contaminated milk to human life and health, we felt that it was our duty, in the meantime at least, to get the entire milk supply of the municipality raised to as high a standard of cleanliness as possible by a well organized system of inspection of farms and dairies, and then have this milk thus produced scientifically pasteurized. We all know, that while milk may be clean, yet it may be far from being bacteriologically clean. Our Commission was instrumental in aiding Mr. McNaught, M. P. P., in getting through a bill in the local legislature giving municipalities entire control over their milk supplies. We are putting forth every effort to encourage the production and sale of the largest possible amount of Certified Milk. There are at present about 1,000 quarts of Certified Milk being sold in Toronto daily. One interesting feature about the standard of Certified Milk in the City of Toronto is the fact that the producers themselves asked us to raise the bacterial standard. We originally asked for not more than 10,000 bacteria per c. c. in the summer-time, and 5,000 per c. c. in the winter. They have expressed their willingness to practically cut this in two and make the count 5,000 in the summer, and 2,500 in the winter. Last summer I do not think the count ever went above 5,000.

"The value of the work which has been done by Milk Commissions would be rather difficult to estimate, and for this we are very much indebted to Dr. Henry L. Coit, because our organization was for the most part based on the standards set forth by Dr. Coit some years ago. The production of Certified Milk is a most valuable means of education along the lines of

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the general milk production, demonstrating as it does what cleanliness alone can accomplish."

Andrew Wilson, M. D., of Wheeling, W. Va., made the following report of the Wheeling Certified Milk Commission, Wheeling, W. Va.:

"A verbal report, and not a great deal to say, but some of our difficulties. Our question is a little different from most of the Medical Milk Commissions, in that it is on a very much smaller plan than most of the Certified Commissions, and has its own difficulties and its own advantages.

"Our Milk Commission has been certifying for over a year, and our production began with twenty quarts a day, and has risen to about 160 quarts a day. The increase has been gradual and continuous. There has never been a week that we have not sold more Certified Milk than we did the week previous. There is no fault to find with the quality of the milk. It is produced on rather a fancy farm, and the producer takes great pride in his production, and consequently we have no difficulty with the product.

"Our difficulty has been a financial one, and if it had not been for the generosity of our producer, I am afraid that we would have gone to the wall, because we were behind something like \$3,000.00. We distributed but a small quantity of Certified Milk over quite a large area, which cost quite a great deal. We made a contract with a big dairy company to handle our product. They handled it for advertising purposes only, and their methods are very far from satisfactory, and will have to be changed."

Report of the Milk Commission of the Hudson County, N. J., Medical Society:

"In this district the Medical Milk Commission certifies to the milk produced in one barn on a dairy where there are three barns. This barn is designated as Barn No. 1, and there are twelve cows in this barn. I will say for this dairy that the whole herd would probably come under the certification, but the dairyman does not want to take the responsibility, as his

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market milk from this dairy received a count of 900 at a national dairy show in Chicago last fall, and we are very proud of the bacterial count of our present Certified Milk. For the Frelinghuysen Dairy I have not the exact figures, but from memory I think it never ran over 500 for January. In January the count was 120; in February, 11; in March, 12; and in April, 50. These samples are taken by our representative.

"These two dairies are solving the tuberculin question by breeding their own cows, and the Schleys Dairy has built a large farm about twenty miles out of Newark. They have had a great deal of delay in getting the right kind of cows. They make a tuberculin test every six months."

Otto P. Geier, M. D., of Cincinnati, Ohio, made the statement that the Cincinnati Commission goes into detail in their printed report.

THE LIMITATIONS OF CERTIFIED MILK.

Charles E. North, M. D., New York.

Certified Milk has been upon the market for eighteen years. From its beginning in Newark, New Jersey, the movement initiated by Dr. Coit has expanded until now the Medical Milk Commissions reach almost every large city in the United States and Canada. The length of time which has elapsed since the movement was started, and the changes which have occurred in conditions connected with the milk supplies makes it desirable to pause and survey the pathway over which we have come, and to estimate the position which Certified Milk occupies in our economy, and which this milk and the Medical Milk Commissions which endorse it may be destined to occupy.

"The Medical Milk Commissions act as the mouthpieces of the physicians of this country on the milk question. The close relation which milk bears to the public health makes it eminently proper that physicians, through their medical societies, should appoint from the membership Milk Commissions to give expression to the attitude which physicians take regarding milk, and to do what it is possible for physicians to do towards securing good milk for the feeding of infants.

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"Measured in quantity, the endorsement given by Medical Milk Commissions to Certified Milk has not brought large results. In the cities where it has been offered for sale the longest it is sold at the present time in the following quantities:

Years.	City.	Quarts	Quarts	
		Market Milk.	Certified Milk.	
18	Newark and surrounding towns..	150,000	3,000	2%
14	Philadelphia	500,000	5,000	1%
14	Boston	305,000	1,800	½%
14	New York City.....	1,500,000	15,000	1%
14	Chicago	1,200,000	12,000	1%
..	Rochester	90,000	2,000	2%

"Thus it is seen that this milk represents about 1% of the supply of large cities.

"If we examine the character of its producers we find that the greater number are men of wealth and of means independent of the business of producing such milk. With a very few notable exceptions the farmer, as such, is not found among them.

"If we examine the consumers we find that they are almost entirely the babies of the rich or of the well to do. Only occasionally does a poor baby get Certified Milk, and then it is either because of unusual intelligence and anxiety on the part of the parent, or because of the benevolence of some philanthropist.

"The price of Certified Milk ranges from twelve to twenty cents per quart, and in the Eastern cities the greater part of it is sold at fifteen cents per quart, against ordinary market milk, which sells for eight and nine cents per quart.

"The Certified Milk business is founded upon the patronage of the well to do.

"It is not milk which the masses of the people will buy, because the masses deem it a luxury.

"It is not milk which the masses of farmers can produce, not only because they have not sufficient capital to afford the equipment, but also because they have not the sanitary training necessary for success.

"Its future can be measured from a business standpoint by its past history and present position. The growth of its

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sales has been slow, so slow that it has not more than kept pace with the population. One per cent of the milk supply of large cities is now Certified Milk, and there is no reason to expect that more than one per cent will be Certified Milk in the future.

"Measured qualitatively, however, Certified Milk has been powerful, and is still so. There has probably been no influence in this country which has done more to draw attention to the importance of testing dairy cows for tuberculosis than the position taken by Medical Milk Commissions on this subject.

"The bacteriological standards which have been set for Certified Milk, and the regular laboratory examinations which are made by the experts of the Medical Milk Commissions have, in my opinion, done more than any other one thing to call the attention of the people of this country to the significance of bacteria in milk, and have been the chief influence which has led to the bacteriological examinations of market milk.

"The sanitary requirements in the cow stable, the dairy utensils prescribed, the use of covered milking pails, all of these excellent advances in dairying have been brought into fashion, and are now widely urged in this country, at least, as the direct results of the movement for cleaner milk initiated by the Medical Milk Commissions.

"While its direct results have been small, and have reached only a select class of producers and a select class of consumers, the indirect influences of Certified Milk have been national, and have reached all classes of producers and all classes of consumers.

"Among all of these influences none has been greater than the stimulation of the public mind to an interest in securing pure milk supplies. The movement for Certified Milk has been followed by a greater and a much broader movement for clean and safe milk for the masses. The insuring of 1% of the supply by the Medical Milk Commissions for prescription purposes has called attention to the remaining 99%, and has revealed the immensity of the problem of securing good milk for the masses. Health officers, scientists, and laymen all over

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this country have become enlisted in the work. As a result the Medical Milk Commissions no longer stand alone, but now find themselves surrounded by numerous organizations, both official and private, which are working in the interests of improved milk.

"The work of these newer agencies has already borne fruit. The results of their work fall into two general classes. The first may be grouped under the term 'prevention,' and aims at the establishment of such sanitary conditions on the dairy farms and of milk handling that a good market milk can be produced in a raw state. The second may be called efforts at 'cure' by 'clarifying' to remove dirt, and by various methods for destroying bacteria. Both methods have as their chief purpose the furnishing of good and safe milk for the large population of cities at a reasonable price.

"As an illustration of what is being done in the line of prevention, I desire to show you something in which I have personally had the privilege of playing a part. The charts on the wall are true copies of the results of bacteriological examinations of daily samples of milk taken from the cans delivered to a shipping station at Homer, New York, by the farmers delivering milk there. Time will not permit me to state fully what the enterprise represents. I can only say briefly that by washing and sterilizing all of the utensils used by these farmers at the creamery, and insisting upon proper cooling the bacterial results are as you see them. All of the cows are tested with tuberculin. These farmers receive premiums for conforming to the requirements of the company. As a rule, these premiums amount to one cent per quart above the local market price for milk. Last month the local price was 94 cents per 40 quart can, and the premiums amounted to 36 cents, making our price to these farmers \$1.30 per can or 3½ cents per quart for tuberculin tested milk containing less than 10,000 bacteria per c. c. This milk is now selling in New York City for 7½ cents per quart wholesale in quart bottles.

"The president of the company (which is called the New York Dairy Demonstration Company) is the same man who first produced Certified Milk, Mr. Stephen Francisco, of the

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Fairfield Dairy Company. I wish to say that his hearty co-operation and understanding of the purposes of the work and his personal influence with the dairy farmers has contributed greatly toward putting this newer system of milk production into practice.

"The milk has been analyzed regularly in the laboratory located in the creamery by the bacteriologist in charge. It has also been tested at the New York market as sold to consumers. The results of these tests are shown on the chart.

"The work has progressed far enough to make it certain that milk from tuberculin tested cows having a very low bacterial count can be obtained in an abundance, and at a price that will place it within reach of the masses of the people.

"One more suggestion to show what is being done in the field of 'pasteurization.'

"The experiences of the large milk dealer in the handling of great quantities of perishable fluid are, many of them, past history with the brewing industry. The handling of beer on a large scale is so much older than the handling of milk on a large scale that the brewer is, in some respects, many years in advance of the milkman. Among other things the brewers have fought out the question of pasteurization. They have passed through the 'Flash' methods and the 'holding' method, and all bulk and loose methods, and have adopted as the final and most perfect method the pasteurization of beer after it is bottled. The beer is first filled into clean bottles. The bottles are then tightly capped with a watertight metal cap, and then the whole package is pasteurized by contact with hot water. All bottled beer is now pasteurized in the bottle. The work is done just as rapidly, and on just as large a scale as is the handling of milk by the largest milk dealer.

"Milk can be pasteurized in the bottle by precisely the same machinery as the brewers use. I have recently visited a number of breweries, and have had milk pasteurized in the bottle by the brewers' machines. The charts show some of these results.

"All chance for re-infection of milk is eliminated by its pasteurization in the bottle. Manufacturers now make bot-

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tles and caps for milk of the same pattern as those used for beer. The operation of pasteurizing milk in the bottle on a large scale is, therefore, entirely feasible and practicable.

"Pasteurization in the home and in the milk depot have been considered ideal because the work was done in the bottle. Now, it can be done by the milk dealer in the bottle on a commercial scale, without altering the flavor of the milk or injuring the 'cream line.'

"I have touched upon two lines of work which will tend to improve the milk supply of the masses.

"It is not for me to say what attitude the Medical Milk Commissions should take towards these. But it seems to me that the Medical Milk Commissions are not necessarily limited in their activities to Certified Milk.

"Serving as they do as the representatives of the physicians of this country, the question arises whether they can afford to bound their activities by the limitations of Certified Milk, or whether they should not lend their support and influence to the improvement of milk for the masses.

"I do not wish to urge upon the Commissions any departure from high standards and ideals, which must always be maintained, nor that they should step beyond the bounds of their province. It is most desirable that there should be ideals. It is important that we should have a milk that is of the very highest degree of excellence, regardless of cost or of commercial considerations. This position Certified Milk occupies. Those wealthy enough to afford the best of other luxuries will always afford a market for Certified Milk.

"But the interests of the masses are always more important than the interests of the classes. Milk, either raw or pasteurized, that is of a quality and price satisfactory to the majority of the people, is even more worthy of the interest and the support of organizations of medical men than is the prescription milk of the rich.

"It seems to me fair to ask whether Certified Milk can entirely retain the position which it has held in competition with good milks at much lower prices.

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"I believe that Medical Milk Commissions may well give due consideration to the propriety of extending their influence and their endorsement of those milks produced by the common farmer, which possess real merit, both raw milks and pasteurized milks. If they should do so, their influence would directly reach all classes of people, and they would become an active party to the great movement for the improvement of the general milk supply which is now in progress."

DISCUSSION.

George S. Baker, M. D., of California: "I would like to ask the price of raw market milk. What do you pay for your ordinary market milk?"

Charles E. North, M. D.: "The prevailing price in New York is nine cents per quart at the present time."

H. W. Conn, M. D., Middletown, Conn.: "I would like to know how old the milk in the fifth chart was?"

Charles E. North, M. D.: "The creamery delivers the milk to the train, the train leaves at half past ten in the morning, and arrives in New York at eleven o'clock on the same day. The milk delivered by the farmers is their night and morning milk. It gets in New York the next night, and the milk is, therefore, twenty-four and thirty-six hours old."

William H. Park, M. D., New York City: "It is certainly a very interesting discussion that Dr. North has started. There are one or two things I want to ask. Is the tuberculin testing done at the expense of the farmer or of the company?"

Charles E. North, M. D.: "I tried to say that every herd is tuberculin tested on these farms, and they have been able to get a promise from the Department of Agriculture of the State, that they should receive allowance, under the State laws, for those cows which were slaughtered. But in addition to this, in order to induce them to have their cows tuberculin tested, even if the State would not pay them for it, this company pays a premium of one-half cent per quart for tuberculin

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tested milk, and in some cases, where the test has put only a few cows out, this premium has effectively paid the farmer for having the test made."

William H. Park, M. D., New York City: "It seems to me we can not quite class them with the other dairies. Dr. North is giving his own experience to these farmers, he is there as bacteriologist, he and his assistants are spending time in teaching these farmers. This is the same as paying them an extra amount, as I understand it, this is entirely at the Dairy Demonstration Company's expense. We have considered it necessary to require the certified farms to bottle at the farm. I think Dr. North thinks that the safest thing is to have all the farmers send their milk to a central station or plant, this central plant being located in a suitable place, and being run in a sanitary manner. This may be almost as safe a method, but the milk is of a different class than the milk furnished by the individual certified farm. I think the last chart showing the effect of pasteurizing, brings before us a very important matter. There is absolutely no question of the fear which we all have of the contamination of pasteurized milk, and I am much surprised to hear, as he has told us, that milk can be pasteurized in the bottles as cheap as in any of the older processes. This gives us a protection which we have never felt for pasteurized milk, which is bottled in the ordinary way in a city plant."

J. R. Williams, M. D., Rochester, New York: "Dr. North says that most of the Certified Milk producers are wealthy. In our community we have six, five of whom are men in ordinary circumstances. One of our producers is a traveling salesman. The greater part of our milk supply, contrary to the usual experience, goes to the middle class and poor people. The rich in Rochester own their own cows. They have a genuine distrust of the municipal milk supply, and most of the milk of Rochester goes to the middle class. The greatest problem which we have in the Certified Milk question is the distribution, and I regard that as the greatest problem. We are making an extended subject of this difficulty now.

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As it is at the present time, half of the proceeds of the sale of milk goes to the distributor. One of the distributors told me the other day, that the delivery of Certified Milk was worth \$5,000.00 per year to him."

M. J. Rosenau, M. D., Boston, Mass.: "My own observations about the rich using Certified Milk show that the rich people, as a rule, do not buy Certified Milk. That is one reason why they are rich."

Andrew Wilson, M. D., Wheeling, W. Va.: "I want to congratulate Dr. North on his subject. It is one I have looked into deeply, and I think he has struck the key to the whole situation of milk. The counts which you see on the wall are better than the milk supply of Wheeling, but can be produced by any ordinary farm with a little intelligent guiding. When this fact comes to be known, for this must be done, the question of a clean milk supply without cooking, to a large extent, is solved. It is possible, where you have to keep milk fifty-six (56) hours, that pasteurization may be necessary, but for all the moderate sized cities pasteurization is not needed, because you can get counts with very little trouble, just as you have there. I can duplicate all of these counts in something like seventy farms, within a radius of twenty miles of Wheeling.

"There are one or two questions I would like to ask Dr. North, and that is, what portion of the cattle tested on these farms had to be slaughtered? Also the temperature of this milk as delivered to the plants?. Also as to the price paid to the farmers? Has he any figures showing that the farmer can continue in business at the price paid? "

Charles E. North, M. D., New York City: "Our object has been to go into the market and compete with other dealers who are buying, and we are surrounded in this locality by five creameries. At the end of each month we take the average of the price paid these five creameries as our basis, and on that we pay a premium. It does not make any difference to us what the other man pays, but we take this average and show it to our farmers. Our farmers always know that they are

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going to get the flat rate of the average milk which is purchased in their locality, and in addition to this they get the premium. This next month our average will only be 84 cents perhaps. Sometimes we pay 94 cents for a 40-quart can, and sometimes it only averages 84 cents. We are in a section of New York State which is probably the largest producing section of the State—Courtland County, New York. It is said that within a radius of five miles 60,000 quarts are produced a day. The reason is that most of these farms keep black and white cows. They have enormous milkers because they use black and white, and with such large milkers the farmers think they are able to make a profit. I want to say, however, that at ordinary prices they can not, and this man H—— had gone out of business when we got into that part of the country, and his barns were empty, but we induced him to go into business again.

Of fifty cows tested, twenty-three reacted. In another case, out of thirty-five cows, seven reacted. One man's herd was tested last year, and again this year, and he had no reactors. Unfortunately, all the cows which were tested, and reacted, were slaughtered, and I attended some of the autopsies, and in a majority of the cows which were slaughtered, the physical examination showed no evidence of the disease, and the autopsies showed only slight lesions in the glands of the neck. I think the slaughtering of tuberculous cattle is something which should be prevented, and it would be an excellent thing for the Medical Milk Commissions to look into the subject, and see if there is not an enormous waste at this time, of animals that would recover from the disease."

Henry L. Coit, M. D., Newark, N. J.: "Dr. North's reference to me in my paternal relation to him, deserves a word. Not that he meant me, he meant the American Association of Medical Milk Commissions. I am reminded in this instance of a little story which I once heard. A man who rendered some service was given a check in payment of these services, drawn to his order. As he was entirely unfamiliar with the use of checks, he simply sent the check to bank without endorsing it. The bank returned the check with the request that

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he endorse it. Not knowing anything about the endorsement, he wrote across the back of the check, 'I heartily endorse this check.' I want to say, as one of the representatives of the American Medical Association, that I 'heartily endorse this check,' and it is presented by Dr. North timidly, as he seemed to think that we might not recognize it or endorse it, but I know of no other organization that is broader in its scope or wider in its views than the American Association of Medical Milk Commissions."

Ben Carlos Frazier, M. D., Louisville, Ky.: "There are a few points which I think perhaps should be challenged. These things do not look alike to all of us, because of different positions and cities. One question is brought out in asking about the extent of slaughter of reactors from tuberculin. Dr. North takes the stand that too many cattle are slaughtered. I think that wrong. I think that all cows that react from the tuberculin test should be slaughtered. It is very hard to keep tab on cows, and, therefore, when they react from tuberculin tests they should be slaughtered. It is a great temptation for cattlemen to remove these cows from the herd, and get them out of the way."

President Rosenau made the following announcement:

"This is a separate question entirely, and, perhaps, will only complicate and carry us far afield from this present discussion. It is a good question, and the Committee may at some time in its meetings take up this problem. It seems to me that if we are to go along these lines of discussion it will take us away from where we are at present, so, unless it is the desire of the Association to take up this part of the question, I think we had better stick to the question at issue."

William T. Cameron, M. D., of Pittsburgh, Penn.: "I am going to try to talk a little. We had some experience in Pittsburgh with our hospital supply. We found that the hospital was getting very bad milk, and they could not afford certified or inspected milk, and we made the same proposition to them that Dr. North puts before you to-day. We had a special herd,

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tuberculin tested and inspected, and the milk cans sterilized at the hospital, and sent back to the farm."

Dr. North: "I had some correspondence with your hospital, some three years ago, which is still in my desk. I corresponded with a Dr. Edwards, I believe it was, and at his request I suggested that he sterilize his cans, and have the herds tested, and he wrote to me later that the process was working well."

M. J. Rosenau, M. D., Boston, Mass.: "At what temperature is milk kept in transit?"

Dr. North: "The milk is all bottled at the shipping station and packed in boxes with lids, and surrounded with cracked ice, as much ice as the box will hold, and I think that this keeps the milk under fifty degrees (50°) all the time. There is always some ice remaining in the box when it reaches its destination."

Charles J. Hastings, M. D., Medical Health Officer, Toronto, Canada: "I want to express my appreciation of the broad field covered by Dr. North in his work. I was very much pleased at his reference to Dr. Coit's paternal relation to the milk question. In the beginning of the campaign for pure milk, Milk Commissions have had a similar experience to that of the surgeons. When antiseptic surgery was first introduced it was not considered safe to do a surgical operation without the use of the carbolic spray. It was not long, however, until it was discovered that this was unnecessary, and so we have been able to eliminate many of the frills in connection with the production of Certified Milk. In referring again to the introduction of Certified Milk, notwithstanding Dr. Coit's modesty in this matter, I think we all recognize Dr. Coit as the father of Certified Milk in this country.

"However, the valuable work done by the various Milk Commissions in the production of the Certified Milk is altogether too limited, as the Certified Milk produced on the continent of America to-day is less than 1% of the entire consumption. Therefore, it must be apparent that something must be done, and done at once, to render the other 99% safe

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for human consumption. And to this end it becomes essential for us to insist that all milk that is not raised to the standard of the Certified Milk must be procured under most cleanly methods, and then scientifically pasteurized before being offered for sale. There is a little pitfall we may get into in regard to bacterial count. While we must use bacteriology as the standard, and the bacterial count as our guide, we all recognize the fact that we may have a low bacterial count, and still have some disease-producing germs in the milk, if it has not been produced according to the conditions and regulations necessary for the production of a Certified Milk.

"It seems to me that Dr. North has presented to us the most ideal solution of the problem in the pasteurization of the milk in the bottles, as this makes it absolutely full-proof, and constitutes the ideal that we should all look forward to."

Otto P. Geier, M. D., of Cincinnati, Ohio: "In this interesting paper of Dr. North's, he introduced one subject in relation to the milk question in which I am interested, viz: 'What shall be the attitude of the Milk Commission toward pasteurization?' As Secretary, I have had the opportunity of looking over the field very widely and seeing what Commissions are most efficient, and when I say efficient I mean efficiency not only in producing a limited supply of clean milk, but extending their influence over the market supply of their particular cities, and as I have them catalogued in my mind, those Commissions who are successful at all, and who are not merely moving around in a small circle, but who are working hard and strenuously for the betterment of the milk supply, are those Commissions who have gone into the field and worked with the Health Department, and in some instances where the Health Department has not been efficient, they have gone into the field absolutely opposing them, and have gone to the extent of driving the politics out of the Health Department. Therefore I say that every Commission must be interested in this question of pasteurization. In Cincinnati we have interested ourselves very widely in the broad problem of the municipal supply, and we feel that our success there is due to the fact that we have developed the public

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sentiment, and devoted our efforts to the betterment of the general supply, and not only the limited supply of Certified Milk. Therefore, as I said, in looking over the Commissions who are in the field, those Commissions who devoted themselves to the general problem such as this are the ones who are most efficient and successful, who have no trouble with their finances, and who are working together in their various committees."

Ogden M. Edwards, Jr., M. D., Pittsburgh, Pa.: "I would like to straighten out this matter about the work which has been done in Pittsburgh. About three years ago we had the milk of our hospitals tested. We felt that the hospitals were not getting good milk, and investigation showed that we were right. The Milk Commission at that time tried to have the hospitals adopt a system such as Dr. North suggested. I wrote to Dr. North asking for the details of this plan. Two hospitals tried it—the South Side Hospital and the Tuberculosis League. It was satisfactory at the South Side Hospital and good counts were obtained—such counts as Dr. North has indicated on his charts. With the Tuberculosis League, however, they were not so successful, and the counts for some reason did not run as low as the other's counts. There was one thing which may have caused this, and that was the possibility of the milk not being sufficiently cooled at the farm. They had no ice at the farm, and the milk was cooled in the shipping cans in spring water, so that the temperature possibly never went down below fifty degrees. It was then shipped into the city—two hours away. The milk tasted, and the method was not considered a complete success."

Henry L. Coit, M. D., of Newark, N. J.: "I would like to move that this program and a broader outlook for Milk Commissions and the milk crusade of Dr. North be referred to the Council of this Association with a view to taking under advisement the presentation of his plan to the Medical Milk Commissions as an endorsement of his broader outlook, and I think perhaps the Council would be a better custodian of this matter."

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The motion is made and seconded that Dr. North's plan, which need not be repeated, be referred to the Council, as that represents and is the pilot which guides the Association. Carried.

THE IMPORTANCE OF A CERTIFIED OR PASTEURIZED BUTTER.¹

Alfred F. Hess, M. D., New York.

The title of my paper may seem somewhat out of the province of the activities of the Association of Certified Milk Commissions. However, the Association has accomplished such laudable results in raising the standard of our milk supply that it seemed only fitting that we should turn to it in seeking a similar uplift of the standard of butter. It is indeed strange that in spite of our knowledge, the fruit of various investigations in this field, the attempts to provide a safe butter have been so feeble.

There is no need of repeating the evidence to the effect that cream contains tubercle bacilli even in larger amounts than the milk from which it is made. When the cream rises, whether it ascends by means of gravity or through the agency of centrifugal force, the fat globules carry with them a large proportion of the bacilli, which are filtered out from the underlying skim-milk into the cream and the sediment. The tubercle bacilli of the cream constitute the tubercle bacilli in the butter. It is difficult to state the percentage of contamination of the butter sold in large cities, but we probably shall not go far wide of the mark if we accept Cornet's² figure of twelve per cent as an average. It has been demonstrated by Schroeder that these bacilli can maintain their virulence, in spite of the salt which the butter contains, for a period of three months. These facts naturally led to a consideration of the subject which has been the main field of contention among those actively interested in the investigation of the

¹ Read at the annual meeting of the Association of Certified Milk Commissions, Philadelphia, May 24, 1911.

² Cornet: Die Tuberkulose, part 1, p. 122.

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cause of tuberculosis, namely, the importance of infection in man by the bovine type of tubercle bacillus, and of the alimentary tract as a portal of entry. It is not necessary in this place to discuss this question in detail. However opinions may vary on these questions, I think that almost all are now ready to accept the conclusion that the bovine bacillus constitutes a real menace to the welfare of infants and young children. The investigation in England by the British Commission, the more comprehensive one in the United States by Park and Krumwiede, and that of the imperial Health Bureau of Germany, force this deduction on us. So that it seems certain that in childhood, and especially in the first few years of life, bovine tuberculosis plays an important rôle.

So much for the contamination of butter by means of the tubercle bacillus. Investigations of recent years have directed us with ever-increasing frequency to the milk supply as the source of epidemics of typhoid fever, scarlet fever, diphtheria, and possibly some other of the infectious diseases. It is difficult to be precise in a discussion of scarlet fever; however, as regards typhoid fever we can adduce some interesting facts to illustrate the lesson of this article. If milk is infected with typhoid bacilli, these organisms will rise with the cream and be incorporated in the butter,³ as we saw was the case with tubercle bacilli. It has, furthermore, been demonstrated by Bruck⁴ that typhoid bacilli can maintain their viability and virulence in butter for at least twenty-nine days, and, indeed, multiply in this medium for the first few days.

In this connection it may be well to consider some phases of this topic which bear directly on our subject. It is claimed by some that the salting of the butter and its maintenance in cold storage kill the bacteria and render it a safe product. This question must still be considered an open one, in that a precise answer as to the exact influence of these factors on butter can not be given. The consensus of opinion, however, seems to be that the addition of from two to three per cent of salt, which is the usual salt content of commercial

³ Hess: Middle Milk Mixtures, *The JOURNAL A. M. A.*, Aug. 14, 1909, p. 523.

⁴ Bruck: *Deutsch. med. Wchnschr.*, 1903, xxvi, 460.

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butter, has but a mild inhibitory effect on bacterial life or growth, and that in spite of the salt and the temperature of zero Centigrade, bacteria have been found to multiply. These experiments record the results of bacterial counts of a gram of butter, and concern themselves with the estimation of lactic acid and other saprophytic bacteria. Such figures have little value for us, as we are concerned only with the viability of pathogenic organisms, such as the typhoid bacillus. As far as I have ascertained, a thorough study of this organism in this regard has not been made.

The attitude of the community toward butter and milk may be stated as follows: The people are warned not to drink milk unless it is Certified or pasteurized; that is, unless it is pure or purified, on account of the danger of tuberculosis, typhoid, and other infectious diseases. Nevertheless they are urged to partake of butter which may well have these same pathogenic bacteria, but which by our silence we seem to concede is innocuous. It may be thought that the danger is slight because the amount of butter ingested is comparatively small. But, although this no doubt mitigates the evil, it does not by any means do away with it. I have shown elsewhere⁵ that partaking daily of milk containing small numbers of tubercle bacilli may cause infection, whereas the same quantity given in one dose failed to produce tuberculosis. It should also be borne in mind that very young children, two years of age or younger, at a time when they are still very susceptible to infection by the bovine bacillus, consume considerable quantities of butter, and are thus exposed to infection.

When we come to consider the remedy of this evil, an evil which I realize is secondary to that of infected milk, we are met by the same difficulties and problems which beset us in the consideration of the milk problem—the ideal of a clean product which we can certify, and the practical makeshift of a safe product which we must permit. The certification of butter should impose the same requirement as the

⁵ Hess: The Subsequent Health of Children Who Drank Milk Containing Tubercle Bacilli, *The JOURNAL A. M. A.*, May 6, 1911, p. 1322.

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certification of milk, specifying besides that the butter be made under clean and sanitary conditions. The demand for certified butter could never be general, for, just as the price of Certified Milk is prohibitive to many a householder, so it would be in the case of the butter. But there are many who, if told of the dangers of the ordinary butter, of its contamination by tubercle bacilli and possible other pathogenic organisms, would be quite ready to pay the additional price for the surety of having a safe product for their children. It would be a butter for children, just as the Certified Milk is primarily a milk for infants and children. Some dairy which has butter-making machinery, especially one situated at some distance from the railway and therefore handicapped in selling its product as milk, might be inducted to put a certified butter on the market. In proportion to the amount of milk used in making butter, butter is less expensive than milk; in fact, this is one of the exceptional cases in which the manufactured product brings less than the raw material. I hope to see this idea carried out in the near future, and do not doubt that some one will be found to enter this field.

Although a certified butter is out of the reach of the masses at the present time, a pasteurized butter, which is the other form of safe butter, is well within their reach. It is noteworthy that in spite of the fact that so many of us realize the advantages of a pasteurized butter, that we know that it is the staple butter in some countries, for example, Denmark, and is used in many other countries, that we have not been able to create a sufficiently strong demand to force the supply of this product. I need not add that pasteurized butter has no distinctive taste, and in color, texture, and other qualities, is no different from unheated butter. I believe that it is high time that it be rendered possible to purchase a labeled pasteurized butter, especially for the use of children. In New York a butter of this kind will be put on the market in the near future, and will cost five cents more per pound than the raw butter. This increase in price is permissible at this time; however, I do not believe that it will be found necessary when the demand is determined and found adequate.

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I believe that if our young children are protected from infection through butter we shall, in a very practical and simple way, be making another step along the road of preventive medicine.

DISCUSSION.

H. W. Conn, M. D., Middletown, Conn.: "In regard to one suggestion of Dr. Hess. The development of the lactic acid organisms of butter in the ripening period is not a safeguard against the development and continued life of pathological bacteria. I want to state that in my own laboratory we have just finished some experiments on that line. They consisted in inoculating into the same lot of milk the typhoid organisms alone, the typhoid organisms with the common lactic acid bacteria of milk, and the typhoid organisms with the Bulgarian lactic organism of Metschnikoff. We had quite a long series. The result was that the development of the lactic acid does not prevent the growth of the typhoid bacteria. These continue to grow, and at the end of our series we still found them present in increased numbers, even in the presence of numerous lactic acid bacteria."

Dr. George S. Baker, San Francisco, Cal.: "The last session of the State Legislature passed an act providing for certified butter, and also providing that certified butter must be produced under the control and supervision of the Milk Commissions, requiring the Milk Commissions to draft regulations, and whenever a butter manufacturer came up to these conditions his production should be certified. I have here with me copies of the regulations which the Milk Commissions of California drafted under that law."

Dr. North: "I just wanted to make two points clear. The first is that some of the prominent dairy papers have recently published a statement that butter which comes from the West, Omaha and Kansas City, is made out of milk which has first been pasteurized and then inoculated with pure cultures, so I judge that a large percentage of the butter is made out of pasteurized milk. Last week I had to sell 1,200 pounds of

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butter made from the milk obtained from this shipping station in New York City, at twenty-two cents a pound, because nobody in New York could be found who would purchase certified butter, and if any one does live there who appreciates it, I would be glad to get their names and addresses."

Ben Carlos Frazier, M. D., of Louisville, Ky.: "I would like to say also that the superfluous milk which is not distributed in Louisville is made into butter. It is tuberculin tested and made from milk that is certified. Neill Roach, the distributor, has been unable to get a continuous supply of butter. He sometimes can sell all of his butter at a very small price over the ordinary market price."

Charles J. Hastings, M. D., Medical Health Officer, Toronto, Canada: "Just one word that would probably be of interest to the members of the Commission: The Ontario Agricultural College, Dairy Department, has been scientifically pasteurizing all the milk and cream used in the college, and all the cream used for the making of butter, for the past two or three years."

Nelson C. Davis, M. D., of Boston, Mass.: "I believe this matter a very important one. Only yesterday I was talking to a large butter dealer who delivers his products mostly to the middle class of our people. He said that last year, owing to the high price of butter, the population of our large cities had become educated to butter substitutes and that as soon as the price of butter goes up again butter substitutes will be used more than ever."

On motion, the meeting adjourned at one o'clock.

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**JOINT SESSION BETWEEN THE CERTIFIED MILK
PRODUCERS' ASSOCIATION OF AMERICA AND
THE AMERICAN ASSOCIATION OF MED-
ICAL MILK COMMISSIONS.**

Dr. M. J. Rosenau, president of the American Association of Medical Milk Commissions, called the meeting to order at 2 P. M.:

"It is particularly mete that in this City of Brotherly Love these two associations, the Certified Milk Producers' Association of America and the American Association of Medical Milk Commissions, should join hands. This joint meeting has been called for a definite purpose. President Miller, of the Producers' Association, will explain."

President Miller: "Ladies and Gentlemen,—It will take but a few words to explain the reason for this joint meeting. The general subject is indicated on the program—"The Function of a Milk Commission." Perhaps it will be beneficial to the Certified Milk interests for the Commissions to know the point of view of these business men who are engaged in the production of milk, and I am sure it will be of great advantage to the business men to know the professional point of view, the professional conception of their function in the community. It is generally accepted now that the Milk Commissions and business men are co-ordinate branches of the same movement. In a great many ways a union between the two strengthens each other, and we hope that this is not the last time that the two Associations will meet to discuss these matters which are of such vital importance to both. I believe, Mr. Chairman, that explains the object of the meeting."

By the Chairman: "It has been suggested that the discussion be postponed until after the reading of the stated papers."

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RELATIONS BETWEEN CERTIFIED AND MARKET MILK.

Stephen Francisco, Montclair, N. J.

There is nothing that has happened in the last decade to help the needs of the human race, to sustain life, to instill strength, and to assist the conservation of child life more than the production of Certified Milk.

The contract for Certified Milk was so emblazoned with light that it dazed those who first looked at it. Some looked through dirty glasses when studying its meaning, finding fault with its requirements, which, they said, would never be accomplished, only to find later that it was the right thing to do. Boards of Health now try to see how closely they can hew to the line of that contract, and they add glory to their names in attempting to follow it.

What's the use?—its demands and requirements will become a law some day. And why should they not? Should we, for profit, destroy by carelessness what our Creator provided for the new-born? Should we not be compelled to care for that which is so much of a necessity?

A certificate means that a Medical Milk Commission has examined the dairy, the barns, the cows, and the milkers, and has made bacteriological tests of specimens of the milk supply, and that the milk is up to its standard. Its relation to market milk is that of a leader. Up and on is its watchword.

Market milk has a larger field—but it should have the tuberculin test for the cows, sanitary control with reference to their diet, water, grooming, and milking. Dr. Charles E. North has given to the world rules and regulations which when carried out reach through the creamery and help the farmer to give to the multitudes a safe milk supply at a reasonable cost. It should not cost more than one cent per quart more to the consumer than the ordinary market milk, which cent should go to the producer, for the dealer needs no more profit to sell a tuberculin tested milk, under bacteriological control, than a milk unfit for food.

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Pasteurized milk under sanitary control need cost but one-half a cent in advance to the producer, and it is free from germs.

It is a new thought in milk to make an agreement with the farmer to pay him for extra care and attention. The experiment has been tried by the New York Dairy Demonstration Company, whose capital stock was taken for the promotion of pure raw milk by men who desired to see worked out the following ideals:

A satisfactory agreement with the farmer to pay for and use tuberculin tested cows.

Milk taken under sanitary control in covered pails from tuberculin tested cows.

Creamery equipped to wash and sterilize every utensil, pail, and can used by the farmer.

A bacteriologist and laboratory to control conditions.

Pasteurizing in bottles or by "holding process" for all milk that does not come up to the above requirements.

Results.

A bacteriologist and laboratory at the creamery.

The farmers, for one-half a cent additional per quart, are testing their cattle with tuberculin under State control.

For one-quarter of a cent additional, milking in covered pails.

For one-quarter of a cent additional, submitting to sanitary control.

This milk has averaged under 10,000 bacteria per c. c. when delivered in New York City, giving untold satisfaction to the physicians for the charity poor.

Now if this can be accomplished so easily, why not demand three kinds of milk:

1. Certified Milk under physicians' control, not over twelve hours old when delivered.

2. Market milk—(a) Tuberculin tested milk, creamery under control of bacteriologist, with laboratory. (b) Sanitary pasteurized milk, pasteurized at creamery, as above, not later than six hours after milking.

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Then the new-born can be safely fed; pure milk will be in reach of the poor. There should nothing hinder this—"Inasmuch as ye did it unto the least of these, ye did it unto Me."

Certified Milk producers, take notice.

THE QUALIFICATIONS OF A MILK COMMISSIONER.

B. L. Arms, M. D., Boston, Mass.

You can readily imagine my surprise last Friday morning on receiving a letter from our secretary saying that he would depend on me for a paper on this subject, and to furnish a fitting climax to his request he thanked me for my, to use his own words, acceptance of this late obligation.

To a certain extent the value of Certified Milk depends on the Commission certifying it, and of necessity the Commission depends on its individual members.

This is a special milk particularly valuable for infant feeding, but its use should not be confined to this; in fact, it is not only its use which is beneficial to the public, but there is another and greater way in which its production is a factor in the fight for clean milk.

This is, in my opinion, one of the most, if not the most, valuable contribution toward this end and which does not return a single penny to the producer. I refer to the example they set and which must impress all who visit the dairies; such a visit will leave its impression and, possibly unconsciously, that visitor will improve his own output.

He has seen the latest and best methods of production, and has seen that cleanliness is the first requisite toward this end.

Can any one see the modern methods of milking and, going back to his own herd, put on a pair of dirty overalls, then with unwashed hands proceed to milk? Will he not take better care of the milk and realize that the rapid cooling means a great deal toward keeping down the bacterial content? In fact, can you conceive of all the many ways in

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which the Certified Milk producers may influence the general milk supply from the example they set to all who pay them a visit, and, even farther than this, those who visit will tell others, and thus the gospel of clean milk is spread. How great this influence is can only be conjectured, but it is surely great.

I realize that the subject was to be the Milk Commission as a factor in the production of a clean milk supply, but I could not resist the temptation to say a few words in regard to the producers as a factor, as it seems to me that their example influences the whole supply to a very marked degree, and I have often wondered if they received full credit for their educational work; no, not if they received full credit, for I feel sure they have not, but have they received any credit for this phase of their work?

Now for a few words on my assigned subject. A man, to serve on a Medical Milk Commission, should be a busy man, for he is the one who can find the time for the needed work, while the one who is not busy never has the time to devote to any additional duty.

He should be practical, and a very novel illustration of practical work came to my notice the past winter. The man—a clergyman—had a portable house, which he set up at a farm where he had obtained permission to give a demonstration of what could be done, and stayed long enough to show conclusively the value of cleanliness, then he moved to another farm, where he repeated the process.

Now, I appreciate the fact that a medical man could not devote his time in such a manner, but this was the method employed by a man last summer in one of our Massachusetts cities.

The Milk Commissioner should be of an analytical temperament, for many times there will be situations to be met that in justice to all must be decided at once, and correctly as well.

He should be willing to work in co-operation with the producers at all times, as they have many things to contend with, and this may be illustrated very well by a remark of

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one of them who recently said he had to depend somewhat on human help. I think we can all appreciate the force of this statement.

The Commissioner is a man responsible for three different parties—the Medical Society which appoints him (I name this first, as this is the body under whose authority he is working); the producer, whose milk is certified, and the consumer.

As a rule, there is a perfect understanding between the Medical Society and the Commission, and the regular reports show what is being done.

Of course, there are more frequent causes for communication with each of the other parties, and the Commissioner often stands as a peacemaker between the producer and the consumer, and on such occasions he must frequently use tact, as it is his duty to be just to both parties; it is also his privilege at the same time to do a great deal for the cause of clean milk.

The public must be trained to understand the difficulties under which the producer is laboring, together with the extreme care necessary at all stages to produce a milk which will meet the requirements of the Commission, and how each step in its production is safeguarded.

For some unaccountable reason, the public apparently considers that milk is milk and that it must not vary in price, while the price of milk products may vary greatly and this is considered a perfectly normal occurrence.

How they can reconcile their ideas in this respect is beyond my comprehension. Finally, the man who can satisfy the Medical Society, the producer, and the consumer, and who can induce the public to demand clean milk, possesses all the qualifications of a Milk Commissioner.

STANDARDS AND SUPERVISION.

Dr. Alfred Hand, Jr., Philadelphia, Pa.

The subject which has been assigned to me is one very important and one very large, and this pamphlet which you will find on display contains my ideas in regard to it. It

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covers the various topics on standards and supervision, so what few remarks I make are in the line of historical reminiscences.

In Philadelphia, thirteen years ago, when we had the subject of Certified Milk under discussion, it took the Committee of the Pediatric Society, which was appointed to investigate the matter, about a year of hard work and study. We went into the subject knowing practically nothing about it. At the end of a year, when we had drawn up our recommendations, the comment was made that it was written by men who knew nothing about it. The requirements were justified. We adopted a rigid standard of 10,000 bacteria per c. c., and our results have not only borne out that standard, but perhaps shows that it would be scarcely any hardship to lower the standard. We have had milks run as low as 320, and the average is far below 10,000. When the cows rise up near 10,000, they generally overshoot the mark, and there is something wrong which needs remedying. Ten thousand seems a fair limit.

The standards which were first adopted we have modified in some respects. We have ceased to certify to sterilized or pasteurized milk. We prefer to have milk unheated before it reaches the consumer. We formerly certified to both four and five per cent milk. That occasioned more or less confusion from our standpoint. We now certify only to four per cent; this partly at the request of our producers. We asked them about it at a conference, and they were almost unanimous in desiring this change.

We were able to eliminate a source of expense to producers in omitting examination of the proteids. After doing it for five years, we found that there was no use in further continuing that examination.

We aim constantly to keep the cost of production of Certified Milk down to the lowest point consistent with safety.

In the matter of supervision I think we are still far from attaining perfection. When we were first established we made one chemical and bacteriological test a month. By eliminating the proteid, we have been able to make more frequent

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bacteriological tests, but we still realize that we have not attained perfection, and we are anxious to adopt any proper suggestions that the producers can give to us. What we want is a safe milk for infants, and we know the producers are willing to do anything we ask tending to that end.

THE CERTIFIED LABEL—ITS USE AND ABUSE.

P. P. Gheen, Willow Grove, Pa.

I have been in the milk business for about ten years, and I can recall but one instance during that time where the certified label was abused, and that was on a pint bottle of milk. If all Commissions had the same requirements as the Pediatric Society of Philadelphia, I am sure that the certified label would never be abused.

I think this matter of certified label is open to discussion rather than for me to talk about it, and I would prefer to hear what others have to say.

MUTUALITY BETWEEN BOARDS OF HEALTH AND MILK COMMISSIONS.

Dr. William H. Park, New York City.

As I regard it, Certified Milk in relation to a Health Department might be somewhat analogous to a private hospital in its relation to a general hospital. The private hospital comes in through private philanthropy to help out the cities' needs. It would be strange if the charities department should not welcome in every way the private hospital, although the private hospital is not, except in a general way, subject to the jurisdiction of the department of charities. In the same way I think it is with Certified Milk. It is a special type of milk which is produced under voluntary co-operation, by a producer who knows how and desires to produce a pure, safe milk and a private board of governors or Commission that agree to present his claims to the people and to help him out in every way by expert advice and to guarantee to the

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people that if he does not carry out the various methods and details promised and agreed upon, that the certification shall be withdrawn. That is, this is a special class of milk, which requires more attention than the city can afford to give without detracting from the general care of the general milk supply. Therefore, I say, there can be no question that the city authorities and the Commission should co-operate. And I think in the same way there can be no doubt that the Commission in accepting their help must be allowed to remain independent in the same way that a private hospital remains independent in a city.

In New York State both the State and city can interfere with the production of Certified Milk. The producer can be directed to do certain things, and he must do those things or the sale of his milk may be stopped. During my connection with the Health Department of New York there have been several times that it directed things to be done which the Commission did not approve of and which, if the Department held its point, would have been the death of the Milk Commission.

Now, how can a health department, if it realize the greatest good, assist a Commission? If it investigates the farms, it should never directly criticise the producer to the producer, but should send such criticism to the Commission, and if both are honest and independent, there should be no difficulty in agreement, and then, through the Commission, let the department's action go to the producer. However, it will happen often that a Commission, in order to save expense, would like to have aid from the department. In New York City, from the very beginning, the Health Department has given an office up-town for the chief inspector for the Milk Commission's farms. It has given laboratory room for the examinations to be made. It has given the glassware, and it has done bacteriological work. But all these things have been done absolutely for the Commission and have been done under the authority of the Commission. The State has aided the Commission in saving expense by testing the cows with tuberculin. The State, especially through Commissioner Pear-

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son, has been most anxious to aid the Commission in every legitimate way. In the City of New York, not only has the Department co-operated with the Commission, but it has called on men like Dr. Freeman to come in when any question of sanitary control came up. This has been of great value in giving to the Department access to the help of men who were making milk a special study.

So, in summing up, I believe there can be no question but that they should co-operate. I believe the Department should facilitate the Commission's work by examinations and otherwise, if the Commission require it in order to get the producer to improve his work. And I believe that the Commission should in every way recognize the authority of the Department, and the Department should leave the Commission full jurisdiction in its sphere, or otherwise it would have to cease to exist.

WHY WALKER-GORDON MILK IS NOT CERTIFIED IN ALL CITIES.

**By Geo. H. Walker, President Walker-Gordon Company,
Boston, Mass.**

It was suggested to me by the president of the American Association of Medical Milk Commissions a few days ago that I say something at this time on the subject of the title above. As it was necessary for me to get together some facts during a very busy season in a very exacting business, I shall not go into details so fully as I should have been glad to do with more time for the preparation.

I shall, therefore, endeavor to confine my remarks to the real obstacles in the way from the Walker-Gordon standpoint.

The first Medical Milk Commission, as you all know, was organized in 1893 by Dr. Coit, of Newark, N. J. The second Medical Milk Commission was organized in New York City at our request in 1894. The third Commission was organized in Philadelphia, also at our suggestion, and others have followed, until to-day they are organized and established in most of the large cities.

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At the Chicago meeting of the Producers' Association, in 1908, when there seemed to be some question as to the attitude the Producers' Association would take towards the Association of Commissions, I offered the following resolution: "Resolved, That no member of the Certified Milk Producers' Association of America shall make use of the term certified in any manner whatever in marketing his products or in his claims as to the standards of his products, unless said products are certified by a Commission of physicians organized and conducted in accordance with the requirements and standards that may be agreed upon between this Association and the American Association of Medical Milk Commissions." At this time I had no doubt that standards would be agreed upon in a few months. This resolution was presented and unanimously adopted, and it is to-day, I think, an important part of the foundation of our Association.

This resolution was presented the next day at the joint session of the two Commissions. At this Chicago meeting I was appointed one of three on a joint committee of the two Associations and entered into the work with high hopes of standardizing requirements for Certified Milk and making these requirements so high that the term would mean so much that all would be benefited by the use of this term and proud to use it.

The joint committee held several meetings, but it was clearly shown that some of the members believe that each Commission should be allowed to make its own requirements and that producers showing a desire to improve their methods should be at once allowed to call their milk certified, although at first the product was far below the quality of most of the producers using that term at that time, and in one instance mentioned a producer was filling an order for Certified Milk in competition at six cents per quart while really not certified. This was obviously unfair, operating either to influence others to lower their standards and prices in order to obtain business, or to discontinue the use of the term. The only definition of the term certified, then, would be, it is milk the producers

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of which use the term certified by permission of a Medical Milk Commission.

I admire the work and the great good that has been accomplished by some Milk Commissions. I am in a position to criticise some Commissions. It is undoubtedly better practice, however, to speak of the good and try to forget the other, and get to working harmoniously if possible and co-operate for the greatest good to the cause and a better condition for all.

Most Certified Milk sells at fifteen cents and sixteen cents per quart, some at a less price. If Walker-Gordon Milk was to be sold at sixteen cents under our present organization and system it would be sold at a loss. It follows, therefore, clearly, that either our work is badly managed or we are doing some things that cost to make the milk or the service better than some others. I take it for granted that all will agree that any business enterprise must make a financial success or it can not be called successful nor long endure.

Some producers of Certified Milk say they are doing business at a loss. This, it seems to me, is unfair, if not immoral, if continued over a long period, and it is to say the least unfair competition, and it would soon, if not at once, become either a philanthropy or a charity, and need not be considered in this connection. Some producers of Certified Milk, supplying the highest quality so far as cleanliness is concerned, claim to be benefited only indirectly and that the work itself does not show a direct profit. Under the present unsettled conditions of standardization there have been passed unfortunately different laws in different States to define the term certified. No law or organization can benefit the cause unless fair to all concerned. If our two Associations could have agreed wisely upon standards several years ago, this legislation would probably have been uniform.

No one person can be blamed for the present state of affairs, but all can be blamed, I take my share of it.

Our Executive Committee recently made an appropriation to pay for the necessary work of preparing standards that can at least be a basis for the final conclusion, and I can not

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urge too strongly the importance of getting together on these standards or requirements, and that quickly. These requirements to be plain and clear, so that all may understand them, so that Certified Milk in one city may mean exactly or practically so what it does in another city.

The lack of standards is one of the reasons why Walker-Gordon Milk is not certified in all cities.

With small dealers, and large dealers, too, for that matter, operating only in a limited district it means but little if there are or are not standard requirements. With our company it means much.

Our producing plant was not accidentally located in the heart of New Jersey, half way between New York and Philadelphia. The location was selected first, after a careful study of the geographical location as related to the large population. Within one hundred miles of this point there are living to-day about one-tenth of the people of the United States. The location of the buildings used in the production of milk was not decided upon until it had been carefully considered from a sanitary standpoint, and also the fertility of the soil was taken into consideration. From this point our products are delivered in all directions. Unless this milk produced at this point can be certified by one Commission and passed to all other districts within a radius of one hundred miles as certified, the use of the term to be respected by all other Commissions and conform to all laws of different States, it would be unpractical if not impossible for Walker-Gordon Milk from this point to use the term certified. It seems to me that it will be obvious to every man present that if we deliver the milk from this producing plant in eight different directions, in eight different cities, where there may be eight different Commissions and each Commission certifying, and that means supervising, advising, directing, and disciplining, all working under different standards, it would not be many months before our autopsy was certified to. We would be certified to death, and financially ruined.

If fair standard requirements can be agreed upon, and if the certification by one Commission can then be accepted by

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all other Commissions, then we come to the next important and necessary step, in order to give the work stability (and I mean by this, stability to the Commission as well as to the stability of the producers). There should be an Appeal Board, to which questions of differences between the producers and a Commission can be investigated and decided upon. I would suggest that this Appeal Board consist of three members, the first to be selected by the American Association of Medical Milk Commissions, the second by the Certified Milk Producers' Association of America, and the third to be some official of the United States Government—possibly a new and permanent office should be created. Such an Appeal Board would certainly give stability to both Associations and relieve them from many adverse criticisms that have been made in the past, sometimes, I am sure, quite unfairly. It will give confidence to the producer and tend towards the security of his investment. It seems to me that the work of such an Appeal Board should be a permanent one and that the three members should be paid for their services and paid well. Those of high ability should be employed; not only ability in this particular line of work, but men in whom all would have confidence, and I certainly will pledge the company that I represent for their share of the expenses of such a Board based on the number of cows employed or on any other fair basis.

The name Walker-Gordon has been before the public for nineteen and one-half years, the first laboratory having been established in December, 1891. This name is our trade-mark. Clean milk can not be produced and carefully safeguarded from the cow to the consumer without a comparatively high cost. High prices can be obtained for clean milk only by years of education of the producer and education of the consumer, and this must be based on confidence.

Advertising in the usual ways will not make a market for a high-cost milk. Consumers usually judge by the cream line. A four per cent fat milk which is clean is to-day considered an ideal milk in its original state for children and for table use.

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The public generally recognizes to-day Walker-Gordon Milk as safe. We have done much to perfect methods for the production and distribution of milk and for special scientific work. We expect during the next two years to make greater improvements in our work than has been made in any similar period in the past. If these plans bring the result, as we have every reason to expect they will, Walker-Gordon Milk will take a much higher position than it does to-day, and my continuous services will no longer be required. If these expectations are not secured, my date for retirement will be postponed. These plans now practically provided for will require the services of experts and a cost of many thousands of dollars, and are in line with modern ideas of efficiency and scientific management. Unless Certified Milk means the highest possible attainment, the use of that term would satisfy or tend to lower rather than raise our standards. If we are all working with the one object in view of improving conditions in the production and distribution of milk, it seems to me quite possible that a greater good could be brought about by our company in remaining as we are to-day, workers with the Certified Milk Producers and Commissions in every way, but continuing to use only the name Walker-Gordon in marking our products.

Conclusions.—Before I can present to my directors a conclusion that Walker-Gordon Milk should be called Certified, it seems to me necessary that, 1st, There must be standards of requirement agreed upon by both Associations, and these standards must be high; 2d, The work of one Medical Milk Commission must be respected by all other Commissions, and one certification must be sufficient to permit the sale of that product as certified in any other district; and, 3d, There must be provided an Appeal Board made up somewhat on the plan that I have outlined.

DISCUSSION.

Dr. Henry L. Coit, Newark, N. J.: "I am very glad to say a word about these matters that have been presented this afternoon. The ideal for Certified Milk has been expressed by

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Mr. Walker—it means the highest possible type of milk, whether it is possible now or possible in a future generation. It means automatic advance, and from that point of view I might say that Certified Milk has never been produced. I mean ideal Certified Milk. If this plan is worth anything, it is worth our labor, toil, and our sacrifice and continued effort. The Milk Commission has been for only one thing—leadership. And leadership means idealism.

“The law in New Jersey, which was made to put the standardization of Certified Milk up to this American Association, makes it necessary that any milk produced in New Jersey certified by a Medical Milk Commission must be milk, the methods and regulations, standards of purity, and quality of which are such as are fixed from time to time by the Association of Medical Milk Commissions.

“Co-operation of health officer and Medical Milk Commission is a very important matter. I see no more effective means of advance than that the powers, represented by the State Board of Health or municipal Boards of Health, shall in some way act in co-operation with Medical Milk Commissions, as is done in New York City and Cincinnati. In New Jersey the secretary of the State Board of Health is by law an ex-officio member of every Board of Health in the State. He attends meetings, makes recommendations, etc.

“In concluding, I have only to compliment the Associations by the altruism represented by our meeting upon this common level, and I think there is only one thing to be expected from such a recognition of one another as we see here this afternoon, namely, permanent and ideal advance.”

Dr. John H. Landis, Cincinnati, O.: “To my mind, there is no reason why there should not be a hearty co-operation between Boards of Health and Medical Milk Commissions. The presence of the Medical Milk Commission in Cincinnati has been a greater incentive to the improvement of milk conditions in that city than any other one thing. Since the appointment of the independent Board of Health a year ago last August, there has been a very hearty co-operation between the Medical Milk Commission and the Health Depart-

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ment. Up to that time the Department of Health was in politics, and a large number of the producers were in politics, and a large number of the milk producers were feeding with distillery waste, and it was almost impossible to put a stop to that practice. The moment that anything was started in the way of legal proceedings to prohibit feeding of waste, etc., it would be called off. Within the last year wet distillery waste has ceased to be used for cattle feeding in Cincinnati. Occasionally we will hear of some one who will go to a distillery after midnight and get a load. But as soon as it is discovered the practice is broken up. One of the greatest benefits that has been derived in Cincinnati from the presence of the Medical Milk Commission there has been the example which it has set for producers of milk."

Hon. R. A. Pearson, Albany, N. Y.: "The president has asked me to say a few words on the question of standard, but I hardly know whether I can add to what we have already heard on this subject.

"The need of a definite standard for Certified Milk, in my opinion, is becoming more and more apparent and more and more urgent each year. The Certified Milk business is a new business. It began in a small way, as all things begin. And the development was along lines that had to be thought out as we progressed. When Dr. Coit formulated his first contract, which was the standard for his Commission, there was no doubt in his mind nor in Mr. Francisco's mind as to what was meant. But since that time Certified Milk Commissions have been formed at many points and there are now a large number of dairymen producing the article, and we have the condition of many men and many things. Now, it seems to us, especially in view of the difficulties which Mr. Walker so well pointed out, that we have advanced far enough so that the two Associations may easily agree upon details—upon details of what might be called a definition of Certified Milk. The Association of Certified Milk Producers, of which I have the honor to be secretary, has carefully studied up this question, as has also the Association of Medical Milk Commissions. There have been several meetings of joint committees.

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The Certified Milk Producers' Association, as Mr. Walker stated, has appropriated a considerable sum of money—several hundred dollars—to enable this work to be prosecuted, and it is their purpose to assist in bringing out a definite standard which will, of course, be acceptable both to the Commissions and to the producers.

"I want to read a resolution adopted by the Certified Milk Producers' Association of America:

"Resolved, That it is the sense of this Association that high standards should be maintained in the production of Certified Milk, and, without any disposition to criticise any Medical Milk Commission, this Committee respectfully brings to the attention of all Medical Milk Commissions the importance of rigidly enforcing reasonable requirements governing the bacterial content of Certified Milk. It is the sense of this Committee that, except under unusual conditions, seldom occurring, which are properly explained and properly remedied, the bacterial count of Certified Milk should not exceed 10,000 c. c.'

"I read that merely as a part of the official records of the Producers' Association which will tend to show their earnestness in arriving at something that is definite. I will not take your time to give details of instances where milk is being certified, when it comes from cows that are not even tuberculin tested, nor, more common, from dairies that have not in some cases the first requirements installed for the production of what any of us would recognize as properly Certified Milk. It is for the purpose of making it impossible to abuse the term Certified by allowing it to be applied to such milks as that, that the Producers' Association is so anxious to have a standard adopted. I hope I will not be misunderstood when I say that the producers of Certified Milk feel very strongly that it is just and fair for their organization to have an official part in the consideration of what the standard should be. These men are thoroughly familiar with the practical side of the subject. The producers who are connected with the Association have invested not far from half a million dollars in their plants. They are anxious to maintain a high

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standard for financial reasons as well as a greater reason, that of a desire to put out the best milk that can be produced for the sick and the babies, as our first president, Mr. Francisco, has so many times emphasized at our meetings. Mr. President, there are no persons more anxious to derive profit from the meetings of the Milk Commissions than the Producers, and the Producers wish to have the opportunity of contributing something definite toward the progress which we feel you are making."

Dr. John F. Anderson, Washington, D. C.: "Just one thought arises in my mind that I would like to give expression to. It was suggested by the paper of Mr. Walker. He spoke of the great desirability of a uniform standard for Certified Milk, and he cited the fact that one of their farms is situated between Philadelphia and New York and that it would be desirable if some way were found so that his milk could be certified in both of those places. That brings us right down to the question of reciprocity. There is an arrangement between the various Boards of Health so that a man who practices medicine in the State of Pennsylvania may be able to practice in New Jersey without undergoing examination. If there is a unification of standards of Certified Milk, the producer who finds himself in the situation of the Walker-Gordon Laboratory Co., may have his milk certified both in New York City and Philadelphia under the same standard. I think this is a very important point and should certainly have suitable weight looking toward unification of standards."

Dr. Charles E. North, New York City: "I had so much to say this morning that I did not expect to say anything more for several days. I am very much interested in bringing to the members of the two Associations which are assembled here the desirability of taking some further action on the subject of tuberculin testing of cattle. Last year I brought this subject to the attention of the Producers' Section, and pointed out what seems to me to be desirable, namely, the tabulating and collecting of the results of the annual tuberculin tests of the herds of all of the Certified Milk Producers, not only for the

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purpose of seeing what the result was in each individual case, but because it seemed to be a matter of great interest for each producer to know what the result was in all cases. Now, as you know, among Certified Milk Commissions and Producers the tuberculin test question may be largely settled—the majority believe it is a good thing—yet it is not a settled question at all among the producers of market milk, nor is it a settled question among the Boards of Health nor the public officials. And it seems to me a great step in advance could be made by the Medical Milk Commissions in co-operation with the Certified Milk Producers, if they would systematically collect the results of the tuberculin testing of certified herds. It is especially desirable to obtain this information regarding certified herds because, among other reasons, the tests are extended over periods of years in the same herds. With this idea in view the Producers' Section appointed a committee for the purpose of collecting results of tuberculin tests of all certified herds in the United States and Canada during the past year. I think something over one hundred different dairies received the list of questions which were sent out. Responses were received from a little over fifty. The questions were somewhat in detail and quite numerous in order to cover all of the points that relate to tuberculosis. One remarkable thing about the replies received was what seemed to be almost an entire absence of reactions. That is, very few of the dairies reported any reactions. That question was asked very specifically in the questions which were sent out. Many of the replies simply had a blank mark or something of that sort after the question. Whether the reports, therefore, are true, or whether there was some timidity as to the publicity which might be given, I do not know, but I believe that many of these reports which have been received by me are inaccurate. Some of them, however, do confess to reactions taking place, especially in the larger herds. Now, it seems to me that the action of the Producers' Section could be very well settled on the part of the Milk Commissions themselves. These tuberculin tests are made under the direction of the experts and veterinarians in each of these Commissions, and I think that the reports

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ought to be tabulated. I understand there is a Committee on Bovine Tuberculosis. Whether that Committee has acted as receiving station for the results of the annual test, I do not know. If they have, I have not seen their report. If we want it done, I would like to suggest a resolution in favor of the systematic tabulation and reporting of tuberculin tests which are made by all of the certified dairies, for the purpose of studying results, with a view of settling this question so far as it is possible to do by statistics. The Certified Milk Commissions could then be looked to for information which will be the basis for the judgments which must be formed in the near future by the departments of health and agriculture, etc., of different States and cities which at the present time are uncertain in their own minds as to whether laws or ordinances should be passed making the tuberculin testing of cattle compulsory or not. I believe that the Milk Commissions have it in their power to settle that question."

By the Chairman: "We are fortunate in having had the hearty co-operation of Dr. Melvin, Chief of the Bureau of Animal Industry, Washington, D. C. I am sure we all wish to hear from him."

Dr. A. D. Melvin, Washington, D. C.: "I, like some of those who preceded me, did not expect to make any remarks—I came to listen, not to talk. The whole subject, of course, is of great interest to me and those associated with me in the Bureau of Animal Industry. That feature relating to tuberculosis is very close to me in my work. The Department considers the disease in cattle as a contagious disease of animals. For that reason we handle it in the same manner in which we handle many other contagious diseases—we prohibit interstate shipments. I do not think that there is any doubt that the sooner cattle owners will look upon this disease in that light and handle their cattle accordingly, the sooner they will get returns on their investment in live stock. That has been demonstrated so thoroughly that it is beyond question, and if I were a cattle owner I should find out which of my cattle were free from disease and which were diseased as soon as

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possible in order that I could check the further spread of the disease.

"The tuberculin test is a very delicate test, one of the most delicate in medicine, and it will often demonstrate the presence of tuberculosis in cattle when it is impossible to determine it by other means. In fact, it is often difficult to determine it with the aid of a microscope, but it usually can be if the autopsy is sufficiently searching. I have had the opportunity of demonstrating this recently in a State where cattle were slaughtered at an abattoir at which this bureau maintained inspection. It was reported that many of these animals which were slaughtered had failed to show any signs of tuberculosis—a very large percentage. I had one of our experts go there and remain for several weeks. He was able to demonstrate thoroughly that a very large percentage of the cattle that were supposed not to be tuberculous were, in fact, tuberculous. Now, it is not my opinion that cattle in that stage of the disease are in any way harmful to the milk. But where can you draw the line? You know you can not say on physical examination just what stage that disease is in. I maintain that no animal that gives a typical reaction to tuberculosis should be allowed to produce milk which is sold in the raw state for consumption. I do not think all of them should be slaughtered. But I do think that any cow which has given a typical reaction should be permanently marked, so that she will always be known as a tuberculous animal. She should be segregated and its milk not sold until it has been properly pasteurized."

Dr. George S. Baker, of California: "We have a State law in California providing that no milk shall be sold as 'Certified Milk' except that produced under the supervision of a Medical Milk Commission. We also have a State Association of Medical Milk Commissions. We are, as you know, a pretty big State, and we do not all have the same problems, but when the State Association of Medical Milk Commissions was formed last month, the members were told very decidedly that the State Association would feel it its duty, and it would not

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shirk that duty, to prosecute any Commission under the State law which would attempt to certify milk on a lower standard than that adopted by this Association, 'this Association' being the American Association of Medical Milk Commissions. So far as the abuse of the label is concerned, we have only caught one dealer abusing it, and that was in Oakland a short time ago, where the chairman of the Alameda County Milk Commission stopped a wagon on the street and found a bottle of Certified Milk, which the driver told him was being produced by the firm for which he was distributing. The chairman knew that this firm was not producing Certified Milk. On returning to the city he immediately notified the pure food laboratory, which sent a sample-taker to this place and asked for Certified Milk, and he was given a bottle from the ice-chest bearing the label of the Alameda County Medical Milk Commission. He asked the dealer if this was truly Certified Milk, and he said, 'Oh, yes.' He also said that he produced it. He said, 'We produce it ourselves,' and when asked if he was under the certification of the Commission, he said 'Yes.' The sample-taker told him he would have to give him another bottle, and he would leave his seal on it and leave it with the dealer, as the other bottle was going to the Pure Food Laboratory. The dealer immediately tried to beg off, and tried to get the bottle back, but did not succeed. The sample was taken to the laboratory, and prosecution will be had of that dealer under the State Pure Food Law. This is the only case of violation that has ever occurred in California."

Mr. F. A. W. Kieckhefer, of Milwaukee, Wis.: "Under whose supervision should Certified Milk be sold? Who was the man who promoted the Certified Milk business in the city? It is only the medical people. I do not believe that any city should authorize its Board of Health to control Certified Milk. It is a separate production by itself, and should only be certified by the Medical Society in each city. Our mode of government, and our way of electing men to that position, for instance the Board of Health is nominated by the mayor, and the mayor does not consider anything at all. He might ap-

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point a man who is unfit. We have such a case in my city. The mayor appointed a man, and a committee of the Medical Society called upon him to ask for the resignation of that man because he was not fit for the office. The ordinary milk is all right, that can be controlled by a Board of Health, but Certified Milk should always be under the supervision of medical men, because they know what they want for their sick children, and I would rather be under medical supervision than under the Board of Health. My experience has been that the medical men are the men who are able to help my business, and they do it without compensation. Who would ask for Certified Milk if it were not for medical people? In our town they did not know what it was when I started it. They asked what it was—they had never bought it—nor had the doctor prescribed it. That is the way we got our business for Certified Milk going. Especially at this stage of the game it has to be produced by a body of men who know what you are giving the people. It can only be supervised by medical men."

William H. Park, M. D., of New York City: "Just one word regarding the tuberculin test that I would like to speak of, and ask advice. I find that in the test for any herd there are apt to be a few doubtful reactions, so that you are not sure whether that cow is tubercular or not. Now I find that the producer and also the State object to having that cow condemned, and in many of these cases the cows are tubercular, and a doubtful reactor from tuberculin when tubercular is just as dangerous, of course, as one that gave a typical reaction, and so the Commission of the New York Medical Society has instructed that all doubtful reactors be executed. Sometimes the State has not accepted this and put the producer to the loss. It seems to me that it saves in the end. It saves the producer, because it prohibits the return of a doubtful reactor to the herd. This refers only to Certified Milk."

Ben Carlos Frazier, M. D., of Louisville, Ky.: "It seems to me that there can easily be a contract between the Certified Milk Producers and the Commission that will govern that question, and just recently it has occurred in Louisville that

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we asked that the Government send us a chart and a Government expert, and in that farm which was so lax as to the disposition of cattle that reacted, we asked him to modify it and give us one more strict, so that all of the reactors should be killed."

On motion of President Rosenau the meeting adjourned at 5.30 P. M.

EVENING SESSION.

Meeting of Council.

THIRD SESSION.

Wednesday, May 24, 1911.

The meeting was called to order at 10:30 A. M., President Rosenau in the chair.

President Rosenau announced that the program would be taken up where it was dropped during the last session, by having Mr. Haney, of the Newark Evening News, tell his experiences in connection with the newspaper investigation of the milk supply in a large city.

Mr. Haney:

"It is quite an error to refer to my remarks as a paper. A newspaper man is usually too busy to write a formal paper, and certainly one who is engaged in investigating the milk supply of a large city.

"I feel considerable timidity in appearing before this body as a speaker. I know that I should be a listener, and yet, if a word which speaks of some improvement in the milk supply of a great city is encouraging, I am glad that I am here to talk.

"I have long felt that a newspaper does not pay sufficient attention to vital topics, the topics that have to do with health, with life, and with death. We love to talk politics, we love to talk of the great reforms of one kind and another that are sweeping over the country, but to those things that are vitally

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important we often give very small place in the news columns, and usually a paragraph on the editorial page. I myself think that the question of clean milk is one of the greatest before the American public to-day.

"As I was passing through Center Market in Newark, which, as some of you may know, is a building a block or so long erected over a canal, I encountered a little restaurant in which the market people take their meals. It was right in the middle of the vegetable market. This was early in February. On the outside of that restaurant was a can of milk, and, as I passed by, I observed that the can was open. As I got exactly opposite, a waiter came out and dipped a glassful out of the can, and gave it to a customer on the inside of the restaurant. It struck me that this was hardly the proper thing. On my way back to the office I passed by a similar restaurant on Mulberry Street, in which the can of milk was standing on the outside with the cover off. It set me to thinking, and that very day I went to our publisher and told him that it seemed to me that it would be a good thing to see how much of this sort of thing was going on in Newark. He authorized me to go ahead, and placed all the money I needed at my disposal. I have been doing nothing else for three or four months.

"If a newspaper is to accomplish anything, it must know enough to talk intelligently concerning the things of which it speaks. It must have facts, and must place these facts before the people, not in an article or two, but continuously. I realized therefore that the very first thing for me to do was to acquire some information about milk, and naturally the name of Dr. Henry L. Coit, whom I had never seen, suggested itself to me. I went to the telephone and called up Dr. Coit's office, and here in part is the conversation between us.

" 'Hello! is this Dr. Coit?'

" 'Yes.'

" 'This is the Newark Evening News.'

" 'I would like to send a man over to have an interview with you this evening.'"

(A long hesitation.)

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"‘I have a Committee waiting on me at 8 o’clock this evening, and I am very busy, but if you will send him around about fifteen minutes before eight, I will try and give him an interview.’

"I went to Dr. Coit’s office, and told him in a few words what I wanted, and the questions I desired to ask him, and I assure you that it was two whole hours before I could get in a single word. At half-past eleven o’clock I arose to go from his office, over the Doctor’s protest. He followed me to the door, out on the porch, clear to the trolley car, even though it was snowing, and when I got on the trolley car he was still talking milk.

"In the interview I had with Dr. Coit, he had given me a good deal of literature, referred me to more, and imparted much valuable information, so after superficially reading some of the books and digesting what Dr. Coit had told me, I felt that I was fairly competent to enter upon this investigation.

"Now I have heard much talk here about market milk, and so far as I have gathered from many of the addresses here, market milk is the milk that sells for nine cents per quart in bottles. I have never tasted Certified Milk. I never was in a modern creamery. I don’t think that I was ever in a dairy that would score more than 55. I have been looking at the other side of the question. To me market milk is the milk which sells for six cents per quart and is dipped out of cans. That is the milk that serves the trade that most needs good milk. That is the milk that the babies in the tenements have to drink, that is the milk that the poor people have, that is the milk that must be made pure, if possible, without any material change in the cost thereof.

"Now, as I say, I started at random. I went to little milk shops in the poorer sections of the town. I gathered thirty samples, sent them to the laboratory in New York and had them analyzed. The samples showed an average bacterial count of 6,650,000 or so. Then I began right. I went to the Board of Health and got the records of people who kept cows in the city, assuming that a man who keeps more than five cows is keeping cows to sell the milk. I went to these dairies,

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about fifteen or twenty of them, and I assure you that since the day I was born, I have never seen sights that so cut me to the heart. I need not describe it. I presume that most of you gentlemen are familiar with the city dairy. The prisons in which the cows go, never to get out until they go to the butcher. I saw cows—and these were extraordinarily good cows—the dealer told me, that had been inside two years without going once outside. I saw dairies in which garbage was fed to the cows. I saw indescribable things. In one dairy I happened to notice a long board hanging by hinges. The board lifted a little, and I thought I saw the nose of a cow sticking out. The dealer opened the door, but it was almost impossible to see the cows. There were five crowded in this small place in the dark, and he was obliged to light the gas so that I might see these cows, and such a sight I have never seen. I printed in the paper not only the counts of the milk shops, but the descriptions of these dairies. I kept this up week after week, and have kept it up month after month. We have tried not to be sensational. I think, in the majority of instances, in order to be strictly within the truth, we have understated the truth, and it is gradually having its effect. Some of the regulations passed by the Board of Health are extremely rigid. At least fifteen or twenty of the milk shops that we have exposed have been put out of business. Thirty or forty more of them have been cleaned up. A number of these city dairies have been closed, others are being gradually cleaned up. A week or two ago I went over the same ground that I had gone over in the first place, this time with a city inspector. I went with a city inspector because I desired not only to get samples of the milk, but I wished to get into the rooms of the shops to see where the families lived. The milk shops are bad enough, they are dirty enough, but those living behind them are filled with the most indescribable filth I have ever seen, and I have visited the slums of large cities many times. I can not describe them, I could not, and I did not describe them in the newspaper. I think it is a crime to permit dipped milk to be sold in a building in which the family lives.

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"In order to take my counts, I made arrangement with the city laboratory to analyze duplicate samples. At the laboratory in New York I got the sterilized bottles, preparations for capping and for properly icing. We went into a place. I myself dipped the milk out of the can and out of the same dipper, filled the bottle which the New York laboratory was to receive, and the bottle which I had, that was to be examined by the city laboratory. These bottles reached the respective laboratories within one half-hour of each other. They were submitted to a five-day count. The results came to me on the same day. I wish to read the results of a few of the samples because I think they present a difficult problem to the mere layman who is trying to talk to mere laymen on the milk problem. I will read first the Lederle count, and then the count of Dr. Connelly." (Schedule of counts not submitted for publication.)

"I did not publish the counts in the editorial column, because to have done so would have destroyed the entire effect of all I had said, which was based of course on bacterial counts. I have been unable to find any explanation of these two counts, and they need explanation to me because I do not know anything about bacteriology, and if I did n't understand it, my readers would not understand it.

"It seems to me that you gentlemen who are interested in these things and know about these things, should have some influence with your bacteriologists in enabling them to adopt uniform technique and uniform standards that will prevent confusing mere laymen like myself with these results.

"Now I want to say to you that newspapers in general are on your side. I believe that wherever this question is properly presented to a newspaper editor or to a publisher, you will not only get a good hearing, but you will get valuable assistance. I think you gentlemen are entirely too modest about asking things of the newspapers. There is a professional etiquette among physicians that I do not understand, being a newspaper man. It is very laudable, no doubt, but you should not let this interfere with the success of the work in which you are engaged. I have been astonished to see what little notice these meetings have had in the Philadelphia newspapers. It is

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not the fault of the newspapers, it is your fault. If you had a proper publicity committee, or if you had a publicity committee at all, I beg their pardon, but this is important, for the transactions of this meeting are of intense interest to the public at large."

DISCUSSION.

Dr. G. M. Whittaker, Chief of Market Milk Section of Dairy Division, B. A. I., Washington, D. C.: "I wish to express my admiration of this talk of Mr. Haney, because I have had an exceptional opportunity to see the newspaper side of the market milk business. For many years I was a newspaper man myself, and latterly in my present position I have seen the way the newspapers treat the milk question in many different cities. Hence, I feel that I may perhaps speak as something of an expert in the matter. I feel that Mr. Haney is rather an exceptional man, on account of the thorough conscientious way in which he has gone about his work, striving to know facts himself, and then striving honestly to inform the public. Now, as a newspaper man with a newspaper man's instincts, I do not like to appear as a critic of what I yet consider my own profession, but I feel that the newspapers are sometimes an enemy to the milk business, because of the sensationalism and exaggeration which is so frequent to-day. Often the milk question does not get such a square deal as Mr. Haney has given it. Every city has its yellow journals which care more for sensations than the more prosy facts. You are all familiar with many illustrations of this. I will cite only one. I was in Kansas at one time, and the milk dealers of a certain city were going to put the retail price up to seven cents per quart, and some of the newspapers had been abusing the dealers in outrageous terms for raising this price. One morning one of the newspapers came out with unbounded commendation of one dealer who had announced his intention of selling milk at five cents a quart. 'The babies will rise up and call him blessed,' said the paper, not knowing that five-

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cent milk is a temptation to adulteration, fraud, and dirt of the very worst kind."

John F. Anderson, M. D., of Washington, D. C.: "I think it is a well established fact that the public has to be educated in all movements of this kind. The indication always exists in advance of any progress made by our executive bodies who have control of such situations. I quite agree with Mr. Haney that we have neglected, in a large measure, the very great aid that can be extended by the newspapers if the subject is properly put before them. The value of the Pure Food Act only came to be known after the public had first been educated to it through the newspapers, and the same thing applies to the milk question. When the public becomes sufficiently educated that they will understand it is to their interest, and the interest of the health of the nation, that we have a pure milk supply, then we will have the matter definitely settled in the proper way. I should like to know what Mr. Haney has done in regard to pasteurization of the general milk supply of Newark."

J. H. Landis, M. D., of Cincinnati, Ohio: "I would like to ask Mr. Haney just how these milk samples were taken."

Charles E. North, M. D., New York City: "I think it is fair that Mr. Haney should know that bacteriologists themselves recognize the necessity for establishing uniform technique in making the bacteria counts of milk samples. There are several kinds of technique now in practice, and during the last few days there has been held a meeting which has as one of its chief objects the bringing about of a uniformity of standards."

Charles J. Hastings, M. D., Medical Health Officer, Toronto, Canada: "What Mr. Haney has suggested, if turned to proper account, I think would be of inestimable value. While the work done by the American Association of Medical Milk Commissions and by the various Milk Commissions has been exceedingly valuable and is now showing fruit probably to a higher degree than ever before, yet if the public were made more conversant with the details of this work and the neces-

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sity for it, it does seem to me that we would accomplish a very great deal more than we have done in the past."

G. Lloyd Magruder, of Washington, D. C.: "It may be interesting to know a little in regard to this point of education. We have been very active in this respect in Washington during the past winter. Coming up this morning on the train with the chief medical inspector of the Health Department of Washington, we were discussing the improvement in Washington, and he said that in the last four months there had been more inquiries at the health office by the heads of families and their representatives. There were more calls at the office and examination of the score cards of the various dairymen than had previously occurred in any of the preceding four years. The result of these investigations is that the bacterial count of the milk supply of Washington generally has very materially improved, but we still have a great deal of bad milk, some filthy milk, and some milk said to be pasteurized, which is worse than when it went into the pasteurizer. This accentuates the necessity of pasteurization being under official supervision."

Mr. Haney: "Dr. Landis asks how I took these samples. I poured the milk into a sterilized bottle furnished by the laboratory, placed them on ice and kept them on ice until they were sent to the laboratory."

Eliza M. Mosher, M. D., of Brooklyn, New York: "I want to say a word about this campaign of education. It seems to me to be one of the most important things that we can do at the present time, and I like very much the suggestion which has been made in reference to the appointment of a committee for the definite purpose of bringing before the public continuously particulars in reference to the production of pure milk (the importance of its use, etc.), not as we have done in the past, but systematically and continuously through the press. I want to say for the satisfaction of those present, that the Public Health Education Committee of the American Medical Association, which was appointed two years ago, has been giving lectures in nearly all the cities of the United States

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on the prevention of diseases of every sort. Addresses on the subject of pure milk have been given during these courses of lectures, and we plan, as the years go on, to make them a very important part of the teaching given to the public. I want to say that in the city of Brooklyn in the course of eight meetings held by the Public Health Education Committee in affiliation with the Medical Society of the County of Kings, one afternoon was practically given up to the subject of milk. A stereopticon lecture was given by the inspector of the Milk Commission, after which we had the wonderful stereopticon 'moving picture' show, which has been gotten up by the Milk Committee of New York, with the assistance of the Edison Company, which I hope you all know about if you have not seen it. It is the story of the change on a farm from the old methods of caring for cows, milking, etc., to the new, shown in a dramatic way."

A HISTORY OF THE CONTROL OF TUBERCULOSIS IN CERTIFIED HERDS.

Dr. George S. Baker, of San Francisco, California.

"**Mr. Secretary:** In view of this absolutely frank and honest statement of the conditions in the central part of California, the Commissions there hope very sincerely that the different Commissions making up the American Association of Medical Milk Commissions will publish, in equal detail, the results of their work, so that we may know whether we have fallen behind, or whether we are in just as good shape as they are. I say this because I am a member of the San Francisco Commission, and am very much interested in the work, and both Commissions are intensely interested. Neither of them are fully satisfied with the results of their work. They feel that to a very large extent they have been working in the dark. We have had absolutely no sign posts to guide us, we blundered along to the best of our ability, and this is the best we could do with the material we had to work on."

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A History of the Control of Tuberculosis in Certified Herds.

The title of this paper should not read "A History of the Control of Tuberculosis in Certified Herds," but "A History of an **Attempt** to Control Tuberculosis in Certified Herds."

Certified Milk was introduced into California by a Commission appointed by the Oakland Home Club, Dr. Shuey being chairman.

At present there are three active Commissions in California, all acting under the authority of county medical societies: Alameda, the successor of the Home Club's Commission, Los Angeles, and San Francisco. A Commission has recently been appointed in Santa Barbara County, but so far has not certified to any product. There was recently organized a State Association of Medical Milk Commissions.

The California Commissions are all acting along the lines laid down by the American Association. They feel that, as the offspring of the parent organization, they are in duty bound to recognize parental authority. They also feel, however, that such obedience entitles them to the sympathy and advice and also to all of the information gained by the parent through experience in the work. They have had the sympathy and advice and benefit of the experience of the American Association in every particular but one, and that one is the most important feature of the whole work.

The fundamental principle in the production of Certified Milk is the eradication of tuberculosis from the herds. The most elaborate equipment, scrupulous cleanliness, efficient cooling, an attractive package, and early delivery, singly or in combination, do not constitute Certified Milk, nor will any or all of them compensate for the presence of tuberculosis in the herd. What success have you had in controlling tuberculosis? Have you succeeded in eradicating it from the original herds you started with; are you able to prevent its introduction with additions? These are vital questions, the answers to which must determine the ultimate success or failure of Certified Milk. The fact that the American Association has not seen fit to give out any information along these lines

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seems to warrant the conclusion that it is not entirely satisfied with the results of its work. But, even if this is true, your experience would be exceedingly valuable to those Commissions beginning the work.

It is axiomatic that confidence begets confidence; it is scientifically true, too, that one sometimes advances as far by a failure as by a successful experiment. If you have made mistakes a frank statement would prevent a young Commission repeating the same error; surely this would be desirable. It was with these facts in mind that the California Commissions determined to present to this meeting a full, frank statement of their condition in regard to tuberculosis. This decision was reached, however, not with the view of exploiting their work, but with the earnest hope that this frankness on their part would result in you opening your records to them, so that each may gain by the experience of all the others.

When the work was started in California it was supposed that all that was necessary to do was to test the original herd, exclude the reactors and disinfect thoroughly. The same procedure was followed in making additions. No attention was paid to the percentage of reactors; the cows that failed to react were placed in the certified herd. As a result of this attitude of the Commissions some of the producers did not exercise proper care in purchasing stock for additions. There was a tendency to purchase without investigating the history of the herd. Sellers were usually unwilling to have their herds picked; as a result it was necessary to buy the whole herd, regardless of its condition. In one case sixty cows were bought, of which fifty-two reacted to the tuberculin test, or were rejected on physical examination. The remaining eight were added to the certified herd. This was in 1909, and it is a very interesting fact that, notwithstanding the above, this herd has shown a continuous improvement to date.

Another producer, however, has not been so fortunate. He started in 1908 with a badly infected herd, losing sixty-five per cent at the first test. He bought additions without good judgment, and at the second semi-annual test in 1909 he lost thirty-seven out of one hundred and seventy-six. To make up

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this loss he bought a dairy of sixty cows, of which twenty-five reacted. This was under the supervision of the San Francisco Commission, and served to arouse them to the fact "that they were getting nowhere very fast." As a result of this they took the most important action regarding tuberculosis ever taken, so far as known, by any Commission. They provided that after January 1, 1910, no additions should be made to a certified herd from lots showing ten per cent of reactions to the tuberculin test. This action was communicated to the Alameda Commission and adopted by them. This action has compelled greater care on the part of the producers; they now investigate the history of the herd very carefully before buying, and they make most of their purchases from small herds, ten or less, and single cows that have been kept for family use. It has also developed the fact that cows from certain sections of the State are free from tuberculosis.

The following figures show the result of tests by the Alameda and San Francisco Commissions in detail from July, 1905, to April, 1911. Considering that the ten per cent rule has been in operation barely eighteen months, the results are surprising:

DAIRY No. 1.

First test—July, 1905.....	71 tested;	15 condemned.
Tested for addition to herd in 1905.....	57 "	11 "
Consists of 6 lots—only one lot without reactors—lot of 4.		
Tested during 1906, including additions to herd:	70 tested;	5 condemned.
	201 "	36 "
Totals.....	271 "	41 "
Tests during 1907	198 tested;	39 condemned.
	(including one lot of 53, with 25 condemned.)	
Tested in 1908:		
Retest of herd.....	129 tested;	22 condemned.
Test of additions.....	68 "	35 " (in-
	cluding one lot of 43, with 31 reactions.)	
1909 to April 18th, only:	83 tested;	53 condemned;
	(including one lot of 60, with 52 reactions.)	

(All above records incomplete—beginning of the work.)

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1910.

August.....	99 tested;	2 condemned.
	27 "	2 "
October.....	12 "	.. "
November.....	16 "	.. "
Totals.....	154 "	4 "

1911.

March.....	123 tested;	3 condemned.
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DAIRY No. 2.

Feb. 22, 1908:

	Tested	Reactors	
Original test-herd on Farm divided.....	106	69	65%
Added to certified herd:	90	61	
	38	22	
	16	9	
	44	23	
	8	1	
	51	43	
	25	3	
	<hr/> 376	<hr/> 231	

Total tested, 1908: 376; Reactors, 231.....62%

1909.

	Tested	Reactors	
First semi-annual test, February.....	189	13	
Additions to herd.....	42	14	
Second semi-annual test, November.....	176	37	
Additions.....	60	25 (to cover above losses)	
	<hr/> 467	<hr/> 89	

These last two tests induced the adoption of the 10% rule, proposed at November meeting and operative January 1, 1910.

	Tests	Reactors
Total tests, including retests (semi-annual):	467	89
Additions during 1909.....	35	..
Totals.....	<hr/> 502	<hr/> 89

1910.

First semi-annual, May.....	246	18
May.....	58	3
	26	..
	111	12
June.....	78	2
Totals.....	<hr/> 519	<hr/> 35

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1911.		
February	202	18
Semi-annual, delayed 3 months.....	14	..
	<hr/>	<hr/>
Totals.....	216	18

DAIRY No. 3.

1908.		
November—Original test.....	72	13

1909.		
March—Additions.....	14	..
April, semi-annual, original herd.....	72	8
August additions.....	10	..
August additions.....	14	1
September additions.....	30	..
October additions.....	47	..
	<hr/>	<hr/>
November, 1909, semi-annual.....	187	9
	99	3
	<hr/>	<hr/>
Totals.....	286	12

1910.		
March additions.....	53	12
Made up as follows:	14	
	33	12*
	6	..
	<hr/>	
	53	12 (added 20-..)
April additions.....	43	..
May, semi-annual.....	139	2
July additions.....	40	4
July additions made up of.....	(36	..)
	(4	4) (all rejected)
August.....	32	2
October, additions.....	25	2
November, additions.....	57	..
November, additions.....	19	..
Semi-annual.....	163	4
December 22-23.....	34	14
	<hr/>	
Totals.....	605	40

*All rejected under 10% rule.

(One lot of 16 had 14 reactors. All rejected 10% rule. Other 18 single cows and passed.)

1911.		
January 9-10.....	32	11 (All rejected.)
January 9-10 (to replace above)....	33	3
February 18-19, additions.....	15	..
February 18-19, additions.....	4	2 (in separate lot, condition far exceeding 10% rule.)

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February 19-20, additions.....	50	..	
February 25-26, additions.....	32	1	(posted and confirmed.)
February 25-26, additions.....	4	3	(All rejected.)
April.....	17	..	
Totals.....	188	20	

Of the total number, 40 were rejected for exceeding 10% rule, leaving 148 tested, with 4 reactors.)

DAIRY No. 4.

1911.

Preliminary test:

January 1-2.....	76	19	
January 2-3, additions.....	17	..	
March 28-29, additions.....	6	..	(to be kept separate until original herd gets below 10%.)
April 24-25.....	74	18	(retest of original herd.)

To recapitulate briefly:

Dairy No. 1.....	in 1909 tested	83	53 reactors.
	" 1910 "	154	4 "
	" 1911 "	123	3 "
Dairy No. 2.....	in 1909 tested	502	89 reactors.
	" 1910 "	519	35 "
	" 1911 "	216	18 "
	(Semi-annual test delayed 3 months.)		
Dairy No. 3.....	in 1909 tested	218	12 reactors.
	" 1910 "	552	10 " (53
	cows were not permitted to enter this herd under the 10% rule.)		
	" 1911 tested	147	4 reactors.
	(40 were refused under 10% rule.)		
Dairy No. 4.....	This dairy has only been in operation since the beginning of 1911. 23 cows have been tested for addition to the herd, with no reactions.		

DISCUSSION.

Ben Carlos Frazier, M. D., of Louisville, Ky.: "I want to say at the outset that it seems to me that the conditions which prevailed where Dr. Baker is located must have been bad primarily; that is, there must have been an unusually large number of tuberculous cattle in that district. We know that in various parts of the United States and in various parts of each

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State, as he has said, the conditions are very different. In Louisville, Kentucky, when the Milk Commission was first established there, and we had the assistance of the State Pure Food and Drug Act, and Dr. Melvin kindly detailed several men from the Bureau this last year, there were a great many cattle killed, and practically all the cows of the dairy herd reacted, and while the condition was bad, it was not near as bad as our State veterinarian anticipated, nor our various members. I was familiar with the conditions, because I was born within twenty miles of the city, and have friends and relations in the dairy business, and knew the conditions which prevailed all around about, and while in certain districts and in certain herds there were a great many reactors, still out of perhaps 250 cows that were supplying milk at the time, I do not think that we have had more than one per cent of reactors. At the second dairy that was certified I made primary inspections and got a very wrong impression of the herd. I said I did not believe there would be any reactors, but out of thirty-three there were eleven. All of the eleven were killed, and since that time, in this same herd, there has been only one cow reacted, and it was killed; so I felt as the question came up yesterday, that while the question of segregation can perhaps be maintained in some cases, and there will be good work brought out of it, especially with valuable herds, still I do believe that if there can be arrangements made with the State or Government, or even with the municipal government, the cows that react from tuberculin should be killed. That is a very frank statement."

Charles E. North, M. D., of New York City: "I do not know whether this is the proper place at which to go into the question which was raised yesterday, but if it is, I have the matter in a form that I would like to bring before this Association. I would like to say in answer to the last speaker, that while the report of Dr. Baker might indicate the prevalence of tuberculosis in certified herds to a great deal larger extent than we would suppose, I really believe that we have no accurate information at the present time on that subject, because it has not been properly gathered together. One of

the most prominent veterinarians of this country, who makes it his business to test certified herds, has informed me that in his opinion the actual number of tuberculous cows in certified herds is at least ten per cent. The largest producer of Certified Milk in this country has told me that while his figures are not in such form that he can be positive as to the accuracy, that he thinks the annual tuberculin testing of his herds show about eight per cent of reacting animals.

"Now I think there are three things connected with this subject, regarding which the American Association of Medical Milk Commissions needs information. The first is as to the results of the annual tuberculin test, and they have it in their power to get that material together by delegating the work to a Committee which will make it their business to gather these facts. The second point is regarding the establishment of uniform methods of making the tuberculin tests; the time, temperature, and the character of the reaction, and all that should be standardized, so that each herd that is tested should be tested in the same identical manner. The third point is one that we have neglected, and that is a full consideration of the proper disposition of reacting animals. I have been greatly impressed during the last year to learn as a result of a careful investigation that has been made regarding tuberculosis in Europe, that the slaughtering of animals which react is being largely abandoned in that country. It has come to be realized that the majority of cows that are suffering from tuberculosis can recover and get well, just as human beings, and that while their milk in a raw state may be dangerous, yet these cows properly handled can produce milk which, if perfectly and properly pasteurized, is a good commercial article and good to use.

"As long as we depend in this country on the appropriations of States and regulations of the Government for the money sufficient to pay for the animals that are killed, just so long will we delay the general practice of tuberculin testing in cattle. I think one of the greatest works that the American Association of Medical Milk Commissions can accomplish would be to initiate some system which would not entail this

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loss, which would preserve the animals and milk, and bring about a general tuberculin testing, which will never be carried out until that work is done."

President Rosenau: "The chair understands that the general subject of tuberculosis has been opened up, and is quite in order, and asks whether Dr. North is prepared for motions, and whether Dr. North has any motion which he desires to make."

Dr. North: "I would like to make a motion that the Medical Milk Commissions, at this meeting, appoint a Committee who will make it their work to gather the information of the results of tuberculin testing of certified herds in this country for this year and all succeeding years, and to report annually at the annual meetings of this Association, and that this Committee also give such information as they can regarding the standardization of tuberculin tests. I understand from Dr. Melvin that the Government has already undertaken that work, and probably this Commission could take advantage of that, but at any rate I think the Committee that I propose in this resolution should make it their business to adopt a standard method of tuberculin testing, and finally they should make a recommendation as to the proper disposition of tuberculous cattle."

President Rosenau: "The motion is simply that the Association appoint a Committee of three to consider these three questions: 1, the results of the annual tuberculin tests; 2, standardization of tuberculin tests; 3, recommendations regarding disposition of reactors."

Motion seconded.

Dr. Coit: "We have a Committee known as a standing Committee on Veterinary Inspections and Protection Against Tuberculosis, consisting of Dr. S. McC. Hamill, the late Dr. Leonard Pearson of the University of Pennsylvania, and Prof. A. R. Ward, who were responsible for the report made to our Association at Atlantic City three years ago, which was adopted by the Association, which was a professional standard in reference to this matter. I am not sure that it includes

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the technique of tuberculin testing, but at the same time I wanted the meeting to know that we had a Committee, whose function it would be to consider this very question. We also will have, I presume, another Committee, if the recommendation of the Council is borne out in the officers to be elected, that a Committee will be engaged very soon in getting together the standards of this Association with reference to methods and regulations and standards of quality and purity for Certified Milk, which must include the methods and regulations in reference to the tuberculin test.

"I approve of Dr. North's motion provided this Committee would not in any way conflict with the standing Committee we now have."

William H. Park, M. D.: "I confess that although I approve thoroughly of the general proposition, I can not see what this Committee is going to do. I should hope that the last part of the duties should be taken away, because it does not seem to me that the Certified Milk Commission has to do with anything except the removal from certified dairies of tuberculous cattle. In reference to the slaughtering of the diseased animals, I think it is entirely outside of the Commission, and it certainly is a big proposition in itself. As to the question of gathering information and making report upon the reactors, that would depend entirely as to whether the different Commissions have the information, and whether they would be willing to go to the great labor of submitting accurate details. Dr. North said yesterday that he had written to different members of the Commission, and that he had received only about fifty per cent returns, and that many of these reports he considered inaccurate. At one thing I am a little appalled, and that is the great number of farms the Committee would have to report upon if they did the work thoroughly; still I think it, if done properly, would be of great value. The last part I would say is entirely out of our province. The Committee would have its hands full with the first, and to attend to the second and third would be out of the question."

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Mazyck P. Ravenel, M. D., of Madison, Wis.: "I think what Dr. Park has said is very much to the point. As far as the disposition of cattle goes, the International Commission on the Control of Bovine Tuberculosis spent an entire year studying the question. It has published a report which should be in the hands of every member of this Association. This report goes into detail thoroughly. The Commission studied the methods and figures from every part of the world and made its recommendations after very careful consideration. In the United States we are confronted by the fact that every State can make its own laws and regulations. One State will have first class laws, while the bordering State will have practically no laws at all."

President Rosenau: "It seems very clearly that two and three of Dr. North's proposition are possibly beyond the scope and power of this Association, and I would like to know if Dr. North would like to modify the meaning of these two numbers of his proposition."

Dr. North: "I am willing to accede to the wishes of the Commissions, of course, in the question of this motion. The first part of it regarding the tabulation of the results, I think, would lead to remedying the very trouble that Dr. Park mentions, namely, that some of the Commissions do not keep accurate tests. Every Commission, as we have seen, should keep accurate records, and I think if the tuberculin test is to mean anything, it should be accurately applied, and we should know how many recoveries they have. Each farm should keep its records, and should send a report to their Commission.

"Now, as to the standardization of the tuberculin test, I have had enough experience to find that veterinarians differ considerably in their practice, and it seems to me that the test is not the same as performed by different veterinarians. The fundamental principles are the same. We might say that the fundamental principles of making petri plates of milk are the same, but the results are not the same. If any other agency has already decided on a standard technique for the tuberculin

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test, it is something which this Association does not have to go into, but it can at least express its approval of a standard method of applying the tuberculin test.

"Regarding the third point, the disposition of reacting cattle, I feel this way, that while the certified dairies may be only under supervision as far as the dairies themselves are concerned, yet I think we have a duty to perform, and that is to find out what is done with these animals. I know of some certified dairies who sell the cows to other dairymen, who use them for milking purposes. These cows were deemed tubercular, they were turned out of the herd that desired to get rid of them, and sold to another dealer, and that milk is going into New York to-day. I think there should be something said about whether these cows should be killed or what should be done, but I am willing to leave that out."

William T. Cameron, M. D., Pittsburgh, Pa.: "I think we lose sight of the functions of the Committee. The third proposition, that the Committee should recommend some disposition of the cows. No Committee has authority without reporting the action to the Association. The first Committee could very well take up the first two propositions, and make recommendations on the third one, which would be for the Association to act upon, but I believe that two Committees on this work would be too many, so I move to amend the motion and extend the number of the Committee to five, and let them take up this work."

Dr. Coit: "This would have to be done through the Council, and if Dr. Cameron will allow me, I would like to pursue his thought in a different manner, namely, of amending Dr. North's motion to ask the Council when they submit their memorandums for officers of Standing Committees to the members of this Association, to re-name the Committee on Veterinary Inspections and Tuberculosis, adding three other members to it."

President Rosenau: "The question is on the amendment to the motion, and that is that the Council be requested to enlarge the Committee on Veterinary Inspections and Protec-

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tion Against Tuberculosis to five, and report back to the Association."

The amendment has been made and seconded. Voted.

Dr. Baker: "I want to advise the Council what they apparently are in ignorance of, that the veterinarian on that Committee is now in the Philippine Islands, and will probably be there for a number of years."

President Rosenau: "Now we come to the question, and it seems that the question has become three questions, and it would simplify it if it were taken up in three motions. Will Dr. North take it as three questions and make the motions in this way. The first was—the collecting of data regarding the results of the annual tuberculin test of the herds supplying Certified Milk."

Dr. Cameron: "I believe the amendment kills that motion—if the Association has no power to act without first submitting it to the Council. What we can do is to recommend to the Council and they can recommend back to the Association."

President Rosenau: "The Association is recommending to the Association that this Committee, which is being enlarged, shall consider the wishes of the Association concerning these tuberculin tests and the collection of the data for its annual report."

Dr. Coit: "I can see no reason why this Association of Commissions should not direct this Committee to make certain investigations."

President Rosenau: "The Association can, if it cares to, direct this Committee to make certain investigations and recommendations. Dr. North suggested that this Committee make this particular investigation."

President Rosenau: "All in favor of instructing the Committee to collect this data and report annually to the Association—"

Voted.

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President Rosenau: "Shall the Committee be instructed to report standard methods?"

Dr. North: "I would modify that to this extent, that if the Committee feels on investigation that among the records of the Certified Milk Commissions there is no standard method of tuberculin testing which the Commissions have adopted, that they recommend the adoption of such a standard, so that all the veterinarians will use that method."

Charles J. Hastings, M. D., Medical Health Officer, Toronto, Canada: "I would like to ask one question in regard to the findings of Dr. Baker in San Francisco. I think it has been generally accepted that as we go north the number of reactors in the herd gradually increase. If that be the case, Dr. Baker having found 25 per cent reactors in San Francisco, you can quite understand that I feel rather anxious after the number of reactors that we may have in the milk supply for the city of Toronto. I would like to hear what Dr. Baker's experience has been in this respect. Unfortunately, there is a tendency with government authorities to minimize the actual number of reactors, therefore it is important that we should have some other means of ascertaining as accurately as possible the number of reactors in the various dairy herds of the continent. From the findings of Dr. Baker in San Francisco, where the cattle are very little, if at all, housed, and therefore practically live in the open air, it would naturally follow that as we go north, where the climate is more severe and where housing of the cattle for from four to six months of the year is imperative, it must be apparent that tuberculosis among cattle is a more serious problem in the North than in the South."

R. G. Freeman, M. D., New York City: "There can be one other solution for this problem, particularly for the larger dairymen, and one that I believe will be the most efficient. That is first to get a clean herd by means of the tuberculin test and then raise their own calves. The cows that are brought in from the outside are the trouble."

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Dr. Park: "In the first place, as to New York conditions, they are very much similar to San Francisco's. I think probably we have a little more reacting cattle in the New York district than there. I think that Dr. Baker's suggestion that cattle be selected from clean herds only is one of the most important for the producer to understand. It seems impossible to make the Certified Milk dealers realize that they should not go and buy promiscuously in the market. They will do it in spite of the most rigid instructions. As Dr. Freeman has said, the best thing to do is to raise their own calves, and it certainly is a risky thing to purchase cattle in the open market. The certified herd will on the semi-annual test usually have a few cows react, but I do not think there is, with the semi-annual test, much danger of infecting the milk. I think the cows which do not react will, before six months have elapsed, hardly develop sufficient tuberculosis to infect the milk."

J. J. Thomas, M. D., Cleveland, Ohio: "We have had tuberculosis in our herds at every test since the organization of the Commission in 1904, although our average is only about four per cent. Of course, when you put Certified Milk on the market, and say it is tuberculin tested, it gives the impression to the laity, and also to the physician, that your milk is tuberculosis free. It seems to me that this is the weakest part of Certified Milk. Milk is not free from tuberculosis as long as you have one cow in the herd with tuberculosis. Because it is a tuberculin test does not mean that it is free from tuberculosis. Dr. Gerstenberger has recently returned from Germany. To my great surprise he has installed a pasteurizer for pasteurizing all the milk sent out from the dispensary. The dispensary has its own dairy, and is producing milk under practically the same conditions as Certified Milk. They also use some of our Certified Milk. He has determined to use the same plan as in Germany, to pasteurize all milk, with the idea of controlling and destroying all germs. He thinks, from statements made abroad, that it is quite impossible to stamp out tuberculosis.

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"Some twenty years ago in Columbus, at a meeting of milk dairymen, the question came up as to the disposal of tuberculin reacting cattle. It was suggested by the members of Milk Commissions and those interested in good milk that the State adopt a plan to pay for the destruction of all cattle reacting. It is pretty well admitted in Ohio that at least one-third of all dairy cows in the State are tuberculous. It is certainly true of all cows supplying milk to Cleveland. Within a very short time the experts figured out that it would cost three million dollars to stamp out bovine tuberculosis in Ohio, and the subject was dropped at once."

Dr. M. P. Ravenel, Madison, Wis.: "There is one point which has not been mentioned in this discussion which has been so often insisted upon that it should not need to be brought forward again, yet it has been apparently overlooked here. I refer to the importance of disinfection of the premises after getting rid of tuberculous cattle. Many people pay no attention to this, though it is one of the most important factors in ridding a herd of tuberculosis. I have recently been in consultation in one case which I may mention. A wealthy man, who runs a fine herd, has been losing for more than ten years from twenty to twenty-five head of cattle yearly, worth from one hundred to five or six hundred dollars a head. He is carrying out the Bang System. On one farm he has his reacting cattle, and on another the supposedly healthy ones. The milk from the reacting cattle is being used to raise calves. I found that it was not being properly pasteurized. Occasionally it was not pasteurized at all, I was told. Before disinfecting this stable, I demanded that it should be thoroughly cleaned. In spite of full directions I made three trips to this farm before it was in condition to disinfect. I refused to do the disinfection until the place was thoroughly cleaned. Stable disinfection is a very difficult matter since most stables are very openly built. We must depend largely on extreme cleanliness and the free use of whitewash. The dairyman who puts any cattle into a dirty and infected stable is bound to find that the disease will remain in his herd."

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President Rosenau: "It is pleasant to hear the fact emphasized that cleanliness is the most essential factor in the production of clean milk."

Dr. Park: "I have found in several of the largest herds that have had dry stock from a non-certified herd which was not tested, that later there would be reactors among these cattle."

A. D. Melvin, D. V. S., Washington, D. C.: "I only wish to emphasize what Dr. Ravenel said about the thorough disinfection of stables and which was also pointed out here yesterday morning. It is one of the most essential factors in eradicating tuberculosis. It is absolutely necessary, and we have seen the necessity demonstrated frequently. We have known dealers to spend large sums of money buying cows and immediately putting the new cattle in infected barns without any disinfection. Sometimes after the slaughter of a herd to buy a new one and without even testing the cows place them in the old infected stable and proceed in the most thoughtless sort of way. Another thing which would be very beneficial is not to buy any cattle for Certified Milk herds which come from any herds where tuberculosis exists. Where this is very difficult the same might be overcome in another way, by buying cattle that have been tested and keeping them isolated long enough to subject them to another test before adding them to the main herd. In one large stable in Washington this has been done very successfully. In buying the cattle you do not usually know the conditions of the test, and you do not know whether it has been properly administered, so you should have this second test made yourself to be certain on this point. Another thing to which I wish to call your attention is the danger of running two herds—a tuberculous free herd and a reacting herd, from which you may be trying to raise calves or produce milk which shall be pasteurized. In such cases I believe it is absolutely necessary to have two separate groups of attendants, or you will carry infection to your clean herd, and if any have such a method in vogue I would caution them against that danger."

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Dr. Baker, of San Francisco: "The test that Dr. Frazier reports makes me think of a report that was recently published in California. This is no reflection on the Doctor at all, but a certain territory in California advertised itself very extensively as having absolutely no bovine tuberculosis in the district, and went on to prove this by quoting a test which had been made by a licensed veterinarian. Upon investigating this test it was found that he had made it in this way. He took one temperature at the time of injection. He took one temperature at the sixteenth hour and based his calculation on it. He got one rise of temperature at the sixteenth hour and reported the animal and it was killed, and there was no lesion found. I could not help wondering if Dr. Frazier's report was not due to something of the same sort.

"Regarding Dr. Hastings' question as to the increase of tuberculosis as we go north. I can only state that in so far as California is concerned, our Certified Milk Producers there find the northern portion of the State the safe portion of the State from which to buy cattle. They get fewer reactors from the northern portion of the State than from the central or southern part."

Dr. Baker: "In reference to Dr. Freeman's suggestion of maintaining a clean herd and raising their own calves. This has been urged by the Commissions in California ever since the work was started. There the conditions differ from almost any other dairy district in the country. The dairymen supplying milk to the large cities have to buy most of their feed, so they do not keep many unproductive cows in the herd. The moment a cow goes dry they sell her. They replace her by buying a fresh cow. It does not make any difference where the fresh cow comes from. They kill their calves three or four days after birth. The producers of Certified Milk, however, have resented, until very recently, the suggestion that they raise their own calves, on the ground that they could not afford to raise calves on milk at fifteen cents per quart, when they could sell all the milk they could produce.

"I am very glad to hear Dr. Park state that the conditions in New York are as bad as California as far as tuberculosis

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is concerned. We have been advertised all over the world as a tuberculosis sanitarium. My own personal experience has led me to believe that California has just about as much bovine tuberculosis as any other State in the Union. I worked for a number of years in Chicago before I went West, and I think I have seen just about as much tuberculosis since as I did in Chicago.

"Regarding the disinfection of the stables after testing, the Commissions there have been insisting upon that ever since they started, and personally I think this is the only reason the Commissions have not been put out of business by tuberculosis. If there is another explanation for the condition to which I refer, where eight cows were added out of a bunch of sixty, the other fifty-two reactors, and the percentage at the next test dropped down to six or eight per cent, I should like to have it. I think the thorough disinfection before the eight cows were put into the herd is the only explanation that can be given.

"In reference to Dr. Park's statement about the certified dairy that kept an untested herd of dry cows. The California Commission made the recommendation at the beginning that no farm should produce two grades of milk, and that no untested stock of any description should be allowed on the farm. That rule has been adhered to, and at the semi-annual test the dry cows remaining on the places are always tested at the same time or immediately following the testing of the milking herd.

"I said to Dr. Geier that most of the purchases in California were subject to the test. They started buying that way. They reached the same conclusion that he says they reached in Cincinnati, that it was economical to buy in the open market and sell the reactors, and that is what they are doing."

THE FUTURE MILK SUPPLY OF NEW YORK CITY.

Dr. William H. Park, New York City.

Before we speak on the future, let us consider a moment the present conditions. We have in New York, as you heard yesterday, the following amounts of the different grades of milk, about one or one and one-half per cent of Certified Milk; about an equal quantity of inspected or selected milk; about twenty per cent of properly pasteurized milk, possibly ten per cent of improperly pasteurized milk, and the rest ordinary raw milk. This last, although it has passed the minimum requirements, is a very unsafe milk. We have employed throughout the State for the supervision of the various farms one medical inspector, one veterinarian, six inspectors trained to a limited extent in bacteriology, and twenty men trained to a limited extent in knowledge of cattle and farm conditions. These men are going about through the State. In the city we have about twenty-five men taking care of the local conditions, and one man especially detailed for taking specimens from incoming trains. We have just started to publish results of the bacteriological and chemical tests. Each month we have a printed sheet posted in an accessible place, not only giving counts, but giving the names of the individuals. This list is being used now by the papers. We are examining weekly about 600 specimens of milk obtained from the farmers as they deliver milk at the creameries. We are examining about an equal number taken in the city from the stores, and about one-half that number from the railroads, milk stations, and various other places. Only the examinations of milk received from the dealers and the creameries are published. We hope this publicity will have a good effect. We try to collect each month a number of samples from each dealer, otherwise the counts would be unfair.

The Future Milk Supply of New York City.

We recognize that milk may be fit for adults which is not fit for children and fit for cooking purposes when not suitable for adults. Bovine Tubercle Bacilli cause ten per cent of the

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deaths from tuberculosis in children dying in New York City, but no deaths have been detected in adults. The same results have been obtained elsewhere. The ordinary filth bacteria which are so harmful in infants and young children are practically harmless in older children and adults.

Under these circumstances we feel that it is safe to say that adults do not need to consider seriously the danger of bovine tuberculosis or injury from saprophytic bacteria. The above indicates clearly that while it is desirable for adults to have clean milk free from bovine tubercle bacilli, it is not by any means so important for them as for infants and children. The authorities feel therefore that children must have a tuberculosis free milk and a clean milk free from any bacteria, either before or after pasteurization, while the adult needs only a moderately clean milk free from pathogenic bacteria. It is well to consider also that some believe children should not have milk heated to a high degree, and some advise that it be not heated at all. No one claims adults suffer from having it moderately heated. It is upon the above considerations that the Health Commissioner, Dr. Lederle, has notified the dealers that on or soon after the first of January, 1912, there will be three grades of milk, A, B, and C.

Grade A—for infants, children, and adults certified (or equivalent such as guaranteed) Selected—Raw. From tuberculin tested herds on farms complying with at least seventy-five per cent of Department regulations (scoring seventy-five per cent) bacterial count should not exceed 60,000, and must not average over that amount on several consecutive periods.

Selected—Pasteurized. From cows passing physical examination on farms scoring sixty per cent on score card similar to that of United States Government and not having more than 100,000 bacteria before pasteurization, not over 10,000 after pasteurization, and not over 500,000 before sale; pasteurization to be a holding process before or after bottling for at least twenty minutes, at a temperature of 140, or for an equivalent time at temperatures between 140 and 160 F. Pasteurization under strict Department supervision.

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Grade B—for adults only, Pasteurized. Milk from herds which passed the minimum requirements—say forty per cent on score card. This milk delivered in bottles or drawn from proper containers. Pasteurization as in Class A selected. Bacteria before pasteurization not to exceed 1,000,000 per c. c.

Grade C—for cooking purposes only. Pasteurized or heated. Milk not included in previous grades. Pasteurized or heated at temperatures above 160.

The Department supervision will, by their own inspectors or by inspectors of Commissions, be most careful of the raw supply, next of selected pasteurized, and least of adult and cooking milk.

Dr. Jacob Lipman, of the New Jersey Experiment Station: "I have been very much interested in the discussion here. Being connected with agricultural interests in the State, and going about among the farmers, I naturally take the producers' point of view. Let me illustrate. We have been carrying on a soil survey in Sussex County, N. J., which is largely a dairy country, supplying a portion of the milk of New York City. Most of the farmers agree that there is very little profit in producing milk under existing conditions. Some of them tell us that if it were not for the chickens and the summer boarders they would have to quit producing milk. To give you an example—I came across a farmer last summer who had a herd of good cows, whose total income was \$2,500 for the milk sold, and the expenditure for feed was \$1,000. In other words, there was left \$1,500 for the interest on the investment, depreciation on live stock, labor, insurance, taxes, etc. This shows that there is really very little profit in producing milk under existing conditions, even though prices are so much better than they have been in recent years.

"Now, of course, all of us who sell milk will agree with the members of this Association that every step should be taken to improve the quality of the market milk, and in so far as the members of this Association and others interested in the production of good milk will make certain demands, the producer will have to meet those demands if he can. He is unfortunately confronted by a situation which is not easy to

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solve, and complicated by the tuberculosis question. This is a live question in New Jersey. I am sure it is a live question in New York State. We know that a large number of cows are dumped on New Jersey as they are in Illinois. I know of a number of herds that in the last three months acquired cows from New York State which did not react, and some months later reacted and had to be killed.

"Under such conditions the production of milk becomes more and more costly, and it seems to me that while the American Medical Commissions representing the consumers are quite right in making certain demands, I should like to see more co-operation between the consumer and those who represent the interests of the consumer, and the producer and those representing the interests of the producer.

"There is a good deal of educational work that needs to be done amongst the farmers, and, furthermore, if we are to maintain a satisfactory supply of milk there should be more co-operation among the farmers themselves and a reduction in the cost of transportation and distribution. I suppose you are aware, most of you, that producers secure less than three cents per quart for their milk. I remember the time when they secured less than two cents per quart in New Jersey. Milk sells for six or eight cents in New York.

"I have had rather instructive personal experience in trying to dispose of the milk we are producing at the College Farm. Now, we try to keep our herd under sanitary conditions. Our stables are sanitary and we produce high grade milk, but our attempts to sell milk locally are resented by other producers. We are told that we have no right to compete with farmers in that locality, hence we thought it best to eliminate the source of complaint. Accordingly, I made inquiries in New York City among retailers as to what they would pay us, and most of them were willing to buy our milk, but six cents was about as much as they cared to pay. This evidently is a high price for milk, milk of very good quality that would come within the definition of Certified Milk. I found that it would cost us about one cent per quart to deliver that milk in New York City, which, with the wear and tear on the cans,

etc., would probably net us four cents per quart for the milk that would come within the definition of Certified Milk. It is evident therefore that while there is every desire on the part of the producer to meet the demands made by the Commissions and the consumers, the problem is a very difficult one for him to solve. It is, in my opinion, entirely within the province of this Association to take such steps as may provide for a reduced cost in the transportation and distribution of milk. Unless this be done, the producer will either be forced to increase the price to the consumer or to go out of business."

THE PRESENT AND FUTURE OF CERTIFIED MILK FROM THE LARGE DEALER'S POINT OF VIEW.

**By Nelson C. Davis, M. D., Sanitarian for H. P. Hood & Sons,
Boston, Mass.**

The milk business is one in which there is much competition and rapid evolution, so the large dealer in milk must move swiftly and decisively to protect an industry surrounded by hazards of both economic and sanitary nature. It is with considerable astonishment that the dealer finds the public still in the dark as to the fact that there are different grades of milk, the cost of which depends on the expense of production, handling, and distribution. As the result of conferences the Bureau of Animal Industry has issued in Circular 114 the recommendation that there be recognized by law three distinct grades of milk; first, Certified; next, Inspected; and, third, Pasteurized. The latter term as defined at the conferences was 145° F. for thirty minutes, in contradistinction to "flash" pasteurization, which implies a somewhat higher temperature for a much shorter time.

The term "Certified" is limited to the product of dairies subjected to frequent and rigid inspection as to the health of animals and employees. The cows must be housed in clean barns of sanitary construction. Employees must exercise scrupulous cleanliness and be free from all communicable disease.

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The term "Inspected" is limited to the product of healthy cows, free from tuberculosis or other disease. The milk shall not contain more than 100,000 bacteria per cubic centimeter and should be bottled in sterilized containers.

The term "Pasteurized Milk" takes in the mass of the milk supply of large cities. The milk must be carefully produced, barns must be rigidly inspected, the milk should be analyzed both chemically and bacteriologically and should be heated to a temperature of 145° F. and kept at that temperature for thirty minutes, under competent supervision.

Certified Milk is an ideal; one that a conscientious dairyman should strive to attain; an ideal that is working for the betterment of market milk; an ideal which, although often farthest from the consumers' mind, should be constantly impressed upon him. The growth and extension of the production of Certified Milk, though limited, has been the result of a persistent demand made by a few leading physicians, especially pediatricians, who have appreciated that clean milk is the most important of all human foods and absolutely necessary for the growing infant and for invalids.

Certified Milk having originated with the medical profession, one would naturally suppose that the education of both physician and consumer would be inaugurated and carried on vigorously by the Commission. It is a fact, however, that this educational campaign at the present time is carried on by the large expert dealer. We must not forget, therefore, that this is a legitimate cost to be charged up to the handling of Certified Milk. Not only has the profession failed to impress upon the consumer the merits of Certified Milk, but the dealer who handles this product often fails to receive the substantial support which should be his. This, I believe, to be the result of two causes; first, many physicians know little or nothing about the nature of cow's milk, for the reason that there is not sufficient time devoted to this important subject in the already overcrowded curriculum of the medical school course; second, there is a lack of thorough teaching in the scientific feeding of infants. To my mind, this last factor is one of the main causes of high infant mortality, one that is now overlooked

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for supposedly more important reasons, but one that should be no longer neglected. Another problem confronting the large milk dealer is the difficulty of retailing this product in city districts in competition with rival Commissions with varying standards and charging of different prices. I believe this Association should give this aspect of certifying milk its immediate attention.

Comparatively few people appreciate the costs intimately associated with Certified Milk. The cost of its production, governed as it is by rigid regulations as to sanitation, may be appreciated by members of the Certifying Commissions, but they are not known to the average consumer. In New England the equipment needed for producing Certified Milk often means a large financial outlay for new buildings and equipment, which is a very important question to our dairymen. One of the great expenses is the cost of freeing a herd of tuberculosis and keeping it in a healthy condition. Then there are the costs of handling, chief among these being the question of loss of the certificate from variation in chemical composition, freezing, and failure to have a sample on the wagon for inspection.

The large dealer must always buy extra milk in order to accommodate the fluctuating demands of the trade and, since milk is perishable and can not be used the next day, this expense must be figured in the cost. Moreover, cows do not give the same amount of milk the year round, and this fluctuation in production is a cost that must be met by the dealer. Certified Milk is handled at a very considerable expense, since the milk must be especially protected both in cold and in warm weather.

Some producers of Certified Milk have two or three grades, depending upon the fat percentage, and this tends to cause confusion in the minds of the consumer, on account of the conflicting prices, which are not generally understood. The importance of reducing the cost of this class of milk to the community is apparent to any observer. Some of the expense could be saved by eliminating unnecessary requirements in the way of equipment and fitting. In Boston the sales of

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Certified Milk at present are less than one-half of one per cent of the total sales of milk, and this in spite of the vigorous campaign made both in advertising and in salesmanship. There does not appear to be any incentive to increase the production, because the demand is not what it should be; and, in fairness to the dairyman, it should be stated that there are more men ready to produce Certified Milk than there are consumers to use it.

There is, however, a legitimate place for Certified Milk; a place that can not be filled by any other grade, the place for which Certified Milk was originally intended—in Modified Milk for infant feeding and for invalids. It is earnestly hoped by the expert milk dealer, health officers, sanitarians, pediatricians, and others, that the prevailing indifference of the average householder to the care of milk will be transformed into a proper recognition of the importance of extreme cleanliness in preparing the infant's food. At present, however, there seems to be but one logical place to modify milk, and that is in a properly equipped laboratory. This process, if carefully done, assures the infant a pure, clean, safe, and proper substitute for mother's milk. Aseptic technic must be practiced and every opportunity for infection be eliminated. It is now a well recognized fact by specialists in infant feeding that properly modified cow's milk made from Certified Milk is the scientific substitute for breast milk, since it can be changed to meet the requirements of each individual infant. Some authorities believe that all milk should be scientifically pasteurized before feeding to the infant.

It is a surprise to the large dealer to find how common is the practice among physicians of feeding infants patent foods in place of the scientific modification of Certified Milk. Furthermore, condensed milk is widely advertised and sold for feeding infants, whereas it is now generally recognized that condensed milk is not always free of bacteria, nor does it usually furnish suitable nourishment for the growing infant when diluted according to directions on the label. Although infant mortality is often charged to dirty milk, we all know that high mortality is in the poorer districts of a city, and investi-

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gations show that it is in these districts that patent foods and condensed milk are most commonly used for infant feeding. There is a need for Federal statistics based upon fact to place truthfully the cause of infant mortality and to give the results wide circulation.

Another factor in delaying wider interest in Certified Milk and stimulating more production is the indiscriminate, untruthful, and sensational newspaper articles which attack the milk business in general, decrease the consumption and fail to mention the producers and dealers at fault. Such publicity not only hurts the sale of Certified Milk, but decreases the use of all fluid milk and drives consumers to condensed milks, about which little is said.

As to the future of Certified Milk. First, it must be decided definitely and finally whether there is any safety in raw milk. Then in view of the fact that there are so many Milk Commissions using varying standards, uniform requirements as to certification should be insisted upon throughout the country. At present the method of labeling varies in different localities, some jars being stamped with the day the milk is to be sold, while others bear the date of milking. It is obvious that the consumer will use the milk which seems to him the fresher, although, as a matter of fact, both milks were produced on the same day, but differently marked. There is need of uniformity here, also in the means of sealing jars. There should be lower transportation rates from the farm to the city. This would be an assistance in reducing the cost to the consumer, and if Certified Milk could be sold at twelve cents the quart it would be the means of stimulating the production and would increase the sales, inasmuch as it would place this exceptionally high grade of milk within the means of a larger number of the consuming public.

The physician already has ideals and he can be of no greater or nobler service to the community he is expected to protect than when he insists upon feeding to infants the highest grade of milk produced, Certified Milk, properly modified for each individual infant.

The problem of clean milk for the masses is to be solved,

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not by uniformed discussion nor by emotional clamor of indignant consumers, nor by the good intentions of producers or public officers, nor by unenforced legal provisions. It is to be solved, as are all other problems of social welfare, by scientific inquiry into the facts involved, by the intelligent formulation of a comprehensive program for constructive work, by efficient co-operation on the part of large dealers, producers, and transportation companies, housewives, health officials, physicians, private social agencies, and by informed, active, exacting citizenship.

DISCUSSION.

George F. Little, M. D., of Brooklyn, N. Y.: "The speaker alludes to the amount of fats and the necessity for modification. I do not know what the conditions may be in other parts of the country, but our producers are anxious to get as good a milk as possible, and our fats run from four to six per cent. This makes the modification a little more difficult, and I am sure that the average physician using Certified Milk in his practice does not allow for this difference in fats. The average man figures that milk is a four per cent article, whereas in Certified Milk he is getting a richer fat, and there is room for error from twenty-five to fifty per cent in his figures in the milk he gives the baby. That it too high a margin of error. The average for the milk produced in Kings County was 4.77 of fat. The last report a week ago showed the lowest fat at four per cent, and that was only one sample, most of them were nearer five per cent, and two of them were over five. Now where these conditions exist, it seems to me that we should impress the fact upon the profession that Certified Milk is a richer milk than that ordinarily bottled.

"In a recent paper I took pains to advise the physicians who are feeding infants to consider Certified Milk as averaging five per cent of fat, and to modify accordingly."

**A SCHEME FOR ORGANIZATION AND CONTROL OF
THE MILK IN SMALL COMMUNITIES.**

H. W. Conn, M. D., Wesleyan University, Middletown, Conn.

"I have a little bit of hesitation in speaking upon this particular subject in a meeting devoted to the consideration of Certified Milk. What I have to say has practically nothing to do with Certified Milk, yet the discussions of yesterday and to-day have been in some respects so far abroad from Certified Milk that this may not be inappropriate.

"Of course you realize that not all people live in big cities, and people who are interested in a good quality of milk have responsibilities outside as well as many of the larger cities. Three or four years ago, in connection with the laboratory of the State Board of Health of Connecticut, I started to examine the condition of milk in the smaller communities, hoping that possibly through the laboratory, of which I am director, I might be of some use to the smaller towns in this connection. Two years ago I presented a few preliminary facts that were discovered in the first year of this work at the meeting of this Association held in Atlantic City, and a few of the facts there reported I will here repeat.

"I found that the State laws were not enforced in small towns because there was nobody to enforce them. There are no local inspectors of milk in the smaller communities; there are no local laboratories where the milk can be examined. The small community in our country is, as a rule, without any protection whatever. This fact applies in general over the country.

"The second thing we determined upon was the fact that it is theoretically and practically possible for a central laboratory to serve as a laboratory for a wide territory, and the milk of the whole State of Connecticut, not a large State it is true, but still of fairly good size, can be handled as far as laboratory work is concerned from one station. Three years ago I made a general announcement in the State that my laboratory was ready to co-operate with the towns that were having trouble with their milk supply, and would endeavor by analysis of

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samples to help out local inspection. That announcement fell flat. There were no towns interested enough to take the matter up. The reasons were, in the first place, inertia; in the second, a lack of interest on the part of small communities as to their milk supply; and in the third, the small cost of collecting and shipping samples that would have to fall upon the authorities. As a result, practically nothing came of this offer from our laboratory to co-operate with the small towns.

"About two years ago I set to work to see if it were possible to start along on any other line. I found there was machinery in existence which might perhaps be useful in this respect, provided it were properly put in motion, and for two years now I have started to put that machinery in motion. I must explain in just a word what the machinery is in our city and State, and while it may be different in different cities, the same principles will probably be applied everywhere. We have in Connecticut, 1, A State Board of Health that is purely advisory in character, without absolute power. 2. A Board of County Health Officers. These are lawyers, whose function is to prosecute cases, and they have also the power of appointing the local health officers. They also authorize all expenditures incurred by the local health officer. 3. A local health officer in the small towns, who is a medical man, whose duty it is, of course, to put into practical application such sanitary rules as may seem to be desired. This seemed to me to be an organized machine by which it is possible for the State Central Laboratory or a State Central Board of Health to get into contact with the smaller towns.

"I brought the matter before the State Board of Health, and I presented to them the conditions which had been found, and the possibility that they might be able, through the machinery in existence, to get into contact with the towns. As a result of this suggestion the State Board appointed a Committee, consisting of myself and one or two others, and asked the county health officers to send a similar Committee, together with the State Dairy Commissioner and the State Cattle Commissioner, who have contact with farmers in the State.

"This set of Committees met in a joint conference. In this

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conference I presented the condition of things in the State, the decision of the State Board to co-operate and if possible to get under some control the milk supply of small communities. The county health officers, the State Cattle and Dairy Commissioners all realized the necessity of the work, and offered their co-operation. Through the State Board of Health there was then called a meeting of all the health officers in the State, to gather in one of our larger cities and consider the milk supply of the State of Connecticut. At that meeting we had an attendance of quite a fair proportion of health officers, a majority of them all.

"At that meeting we had the subject of the milk in the smaller towns in the State presented, first, by the local health officers from a local standpoint; secondly, from the Doctor from a large city, giving certain medical aspects of the problem; third, by one of the milk inspectors in one of the smaller towns, showing what could be done in a small community, and then by myself presenting facts showing what we had found about the condition of the milk in the smaller towns, and the plan that had been proposed to meet the conditions. The plan was briefly as follows: That each local health officer should be *ex-officio* milk inspector of his town. A perfectly possible suggestion because the laws are rather wide concerning the powers of health officers. Then my laboratory offered as rapidly as we could to put into the hands of the local health officers in the towns around the city milk shipping cans, which we supplied, in which the milk could be shipped by express to reach our laboratory in a fresh condition for examination. These we offered to put into the hands of the health officers, beginning with the health officers who were enough interested to ask for them. The county health officers said they would authorize the small expenses that were incurred in collecting the milk and shipping it. The suggestion was received with approval, and after the meeting the work began.

"Now we have a little over a year's experience working under this plan, and the result of that year's experience has been promising. In the first place, we received cordial support, the health officers all over of the cities and State re-

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sponding pretty readily. I sent a circular letter to different parts of the State to different health officers, telling them that we wanted to begin this work in their community, and that we would send them the shipping cases if they would send the milk into the laboratory.

"We began at once to get samples, and from that time on we have had sent in to us all of the samples that our laboratory could handle with the equipment we have had. We have kept this up something more than one year, with an interest that has been constantly growing, and now I may state that we have touched every town in the State of Connecticut that is large enough to have milk dealers. We have about 170 towns in Connecticut, but there are about fifty of them that are only country villages, where the farmers only sell milk to their neighbors. We have actually come in contact with the milk of at least a hundred of the towns of the State, including all of the smaller cities, all of the larger towns, and all of the smaller towns containing from 800 to 1,000 inhabitants and from that up.

"The result has been that we are at the present time examining milk samples as rapidly as our laboratory can handle them. We can only handle about 300 per month with the force which we have. Two reports are sent to the health officers. First we send to the health officers a general report of all of the samples sent to us; second, we send also to the health officer an individual report of the examinations of milk of each individual dealer. This is to be given, and is given, to the man who distributes the milk, so that each dealer gets an individual report of his milk coming through the health officer, although coming, of course, indirectly from us.

"Now as to the results. Of course the experience we have had has not been long enough to get complete results up to this time, but what we have already seen is very satisfactory.

"1. There has been developed a very much wider interest in the milk problem of the small community than ever existed in Connecticut before. The people are becoming interested, as is shown from the fact that when I took this matter up at first there were only two of the larger cities in the State of

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Connecticut that had milk inspectors and a fair examination of the milk, with one other milk inspector who was doing very little work. At the present time there are something like twenty-five of the cities and towns in the State that have appointed milk inspectors. These inspectors are more or less efficient, and are all working with the dealers and are constantly sending samples to our laboratory for examination. Here is an increase of from three to twenty-five in the course of two years, and I think that this is enough in itself to show the value of the work such as has been started in my laboratory.

"2. We have a large number of local health officers who are not especially appointed milk inspectors, but who have become very much interested in the question of milk in that community where they live, and who never thought of it two years ago. They do not now wait for us to send our milk-shipping containers, but frequently ask for them.

"3. Of course we got hold occasionally of dishonest dealers and find samples of watered milk, etc. In these cases we bring them to the attention of the Dairy Commissioner. He can not be in touch with the whole State all the time, but if the weak points are given him by us he visits them at once, and works with producers and dealers trying in every way to remedy their errors. Our plan relieves the Commissioner and inspectors of a great amount of work in inspecting the good dairies and by concentrating their work, and makes them efficient where efficiency is needed. The dishonest dealers who are watering their milk are brought to the attention of the Dairy Commissioner, and the attention of the local health officer in this town is called to the Dairy Commissioner, and they get together and co-operate in this particular town.

"4. There has been an improvement, but not a very great improvement, in the quality of milk in these places. In all of the towns where they have appointed milk inspectors there is a marked improvement in the milk. In the other towns where there is no inspector the improvement has not been so noted.

"5. Wherever this has been thoroughly done we have found

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a reduction in the death rate in diarrhoeal diseases in summer on the part of children.

"What I have presented here this morning, as you will see, is simply a first attempt to try to teach the small communities of a State through a central laboratory. The plan which we have organized there has its weakness, as all plans have, more or less. In the first place, these milk inspectors and health officers are not all interested in the work. Some of them are doctors who haven't a very large practice, and they like to work for a day and put in a fee for it. But on the other hand, as you will see, this does one thing that was urged at the meeting here yesterday. It does bring the health officers of the State in contact with the milk problem, since it brings the health officers, county health officers, and the State Board of Health into personal contact with the problem of a clean milk in all the communities of the State. The work promises to develop into something of value. What we shall get out of it in the future can not be told. We are just getting the interest aroused. We are getting the people interested and, above all things, we are getting the milk dealers interested in having the reports come back to them to show that they are selling good milk.

"Now, these facts, I think, you will all recognize have a close connection with the discussions of the last few days upon some important features in the milk problem. In considering the problem of pure milk this Commission should recognize that there are other responsibilities in the milk question beside the big cities. People from the city go to the country, and the milk in the small towns is not as pure as the milk in the city. I think that in each State, by a proper consideration of the machinery that is already in existence, and getting it to run along in the right way, we can, little by little, get our fingers on the milk question in small towns through the organization of a central laboratory by the State Board of Health or by some other means which may be developed in some other places."

Dr. North: "Dr. Conn has said that the milk supply of the large cities is better than that in the small towns, and it

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has been suggested that the reason for this is that the milk in large cities is older than the milk which small cities receive, and that the pathogenic organisms are killed off. I think Dr. Conn's paper offers the real explanation for it. It is true the majority of epidemics from milk occur in small towns. Dr. Conn's suggestion is a valuable one."

Andrew Wilson, M. D., Wheeling, W. Va.: "It seems to me that while the time is short, this subject that Dr. Conn has brought up should receive discussion. It is to my mind one of the most important questions that has been brought up. It does not only show advantage to the small community, but is the key to the milk supply of the larger cities. Large cities have a great deal of difficulty in instructing at the farm. If you would train efficient inspectors that are personally familiar with conditions and personally acquainted with the producers, those inspectors would have an advantage that it would be almost impossible for a city inspector to get. The educational value of this will be immense, and it will be reflected in the milk supply of larger cities, in that you get efficient inspections at the beginning on the farms, where it is undoubtedly most needed, as any error here is multiplied many fold before the product reaches the consumer.

"I have been doing a little work myself in inspecting the milk supply for a small city other than Wheeling—Martin's Ferry, across the river from us. We send them sample cases just as Dr. Conn does, and it is working out very satisfactorily, and I think that Dr. Conn's plan will undoubtedly be efficient and workable.

"I would suggest that if it can be arranged in each town where these inspections are made and where the reports are sent back, if these reports are published in your daily or weekly papers you will find that it will add immensely to the efficiency and interest taken in your inspections, and it will also add materially to the interest that the dealers and producers take in their report if it is known publicly that these reports are to be published. We publish our score cards each spring. We publish our reports for fat each month. We publish the bacterial counts each three months, and since the

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time of starting this we have improved our milk supply and have practically done away with prosecutions and legal proceedings."

Dr. Park: "In New York about a year ago we discovered that more than one hundred cases of typhoid were caused by milk coming from a place called Camden. On investigation we found that they have had what is called 'Camden Fever.' For years the people in this town have been supplied with milk by a certain man who is a typhoid carrier, yet the health officer apparently knew nothing of the real nature or cause of the disease. I think that such work as Dr. Conn is doing would prevent the possibility of these conditions persisting, and I think it would be a very excellent thing for other States to follow his lead."

REMARKS ON THE FORWARD MOVEMENT OF THE AMERICAN ASSOCIATION OF MEDICAL MILK COMMISSIONS.

Dr. Henry L. Coit, Newark, N. J.

"Just a few remarks regarding this subject. Jaded as I am, after five hours with the president and his associates at the Council meeting, which lasted until 2 o'clock this morning, I am looking out of jaded eyes, and I imagine I see you all in the same predicament.

"There was one gentleman here this morning who pleased me mightily, Dr. Davis, whom I judge is not practicing medicine. I want to say a word about the middleman. I have forever been opposed to the middleman in any part of the program of the American Milk Commissions in the production and distribution of Certified Milk, and after hearing the paper by Dr. Davis I have been convinced that the Medical Milk Commission has to reckon with the middleman in some way or other, at some time or other, and I feel like putting my arms around Dr. Davis. Except it might possibly be Neill Roach, of Louisville, he is the first middleman I have felt that way about. I am perfectly willing, as the 'grandfather' of Certified Milk, to add my benediction to that kind of a middle-

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man. Yesterday I was taken for a producer. A producer is a very good thing to impersonate. If a man is n't a producer he does n't amount to anything. I was asked by an intelligent member of yesterday afternoon's meeting where my farm was situated. I think the blood came to my face. I said to myself, 'Heavens and earth, has it come to pass that the public thinks we are a combination?' This is what I always have been striving against. But on that connection we Medical Milk Commissions can not have the same influence, and because I have felt this fear and been fearful of its consequences to the cause of clean milk and Certified Milk, I have been forever opposed to very close relations between the dairymen and the Medical Milk Commissions. It was never the design of the American Milk Commissions to sustain this relationship. There are too many dairymen who are not under the certification of the Commission, and who are surreptitiously placing the term 'Certified' on their bottles.

"I should like to define what the position of the American Association of Medical Milk Commissions should be: The relation between the Medical Milk Commission and the dairyman.

"First—for conference. Now anybody would more quickly say conference all the time between the Medical Milk Commissions and the dairymen. Conference as we have exemplified it in this Association of Medical Milk Commissions in appointing a Committee in this Association to confer in practical conference with the members of the American Producers' Association, and we call that a joint Committee, and to report back to this Committee improvements in standards, methods, and regulations, and the methods to improve this plan of Certified Milk. Conference we should deem also co-operation—co-operation to improve our standards and our methods or regulations, but never in my judgment should there be any organic relation between the Producers' Association and the Medical Milk Commissions, no organic relation to such a degree that they should dictate the final standards. The final court should be the American Association of Medical Milk Commissions, as has been expressed by our president and former presidents.

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There must be a rigid distinction between the producer and the American Association of Medical Milk Commissions. The relation that exists between us is very much like the relations which exist between the bank and the business men. Does the business man have any voice in determining the methods the bank shall employ or the methods they may use in making investments? No; but the business man is taken into confidence; in fact, the business man may in some way dictate terms to the bank by his experience, as the producer does to us. That is not conference in any organic combination.

"We must not confuse the public. We must have the public clearly to understand that we are a professional body with high ideals, that must be in constant communication with the dairymen, who also have high ideals.

"The forward movement of the American Association of Medical Milk Commissions has its origin and principle in the person of our secretary. What does he mean by this man in the field? He means that we must have some efficient aid to give cities like Roanoke, Mobile, Atlanta, and the other Southern cities when they write us and ask us to come and help them. Here is a city in the summertime with no ice. Here is a city with milk conditions which are so dreadful that no infants, sick or well, can take the milk of this town without menace to health. The milk conditions of the South are in a dreadful state. They tell us they want a Milk Commission, they want Certified Milk. I wrote seven letters to Dr. ———, of ———. What is the result? I wrote five hundred letters one year. What does it mean? Money gone and we will do the same thing again. Is it fair to us? We want missionary work—a man in the field—a man to go into the field to look into the needs of the different cities. When he gets the bacteriological findings of the milk, and finds their methods of producing milk, and comes before the Society with a picture of it, they will form a Medical Milk Commission. He will stay there until the Commission is a reality, and until the program which we have tried to establish is established there. This is the kind of work which should be

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done, and this is what we are trying to do in this forward movement."

On motion the meeting adjourned.

FOURTH SESSION.

Wednesday, May 24, 1911.

The meeting was called to order by President Rosenau at 2:30 P. M.

Report of the Proceedings of Council read by the Secretary, Dr. Otto P. Geier.

Proceedings of Council.

Present: Drs. Rosenau, Kerr, Coit, Edwards, Geier, and Hamill. The latter was asked to sit with the Council in place of Dr. Tuley, who was absent. Dr. Rosenau was elected Chairman pro tem.

Dr. Myers' report as Treasurer was first presented by the Secretary, in the absence of the Treasurer. On motion of Dr. Coit, seconded by Dr. Kerr, it was moved that the report be accepted. On motion of Dr. Edwards, seconded by Dr. Hamill, it was moved to accept the report without further audit.

The Secretary made a supplementary report to the Treasurer's report, of the expenditures since the rendering of Dr. Myers' report, which showed an approximate deficit to date of \$500. This brought forth a very lengthy discussion as to the further work of the Association and its necessary restriction because of the financial status of the Association. The income from the sale of Proceedings (\$185) helped very materially to meet the deficit.

The Secretary stated that there was a necessary delay each year in the publication of the Proceedings, since the state of the treasury did not permit the entering into contracts for publication until such time as the Treasurer reported sufficient

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funds in the treasury; that each year thus far, the Association, through its Secretary, had been forced to give out the contracts for the Proceedings, not knowing that the Association would be able to meet the account.

On motion of Dr. Hamill, duly seconded, it was determined to publish at an early date a revised Manual of Working Methods and Standards. A committee, consisting of Drs. Kerr, Hamill, and Coit, was appointed.

On motion of Dr. Hamill, duly seconded, the publication of the Proceedings of the Fifth Annual Conference was deferred until authorized by Council.

The following motion, presented by Dr. Edwards, duly seconded, was adopted, after very free discussion:

"No Medical Milk Commission shall be considered a component member of the American Association of Medical Milk Commissions which, in the opinion of Council, fails to conform to the standards and requirements promulgated from time to time in its Manual of Working Methods and Standards. Only such Commissions as are recognized by this Association as complying with its requirements, are authorized to use the term CERTIFIED MILK."

The place of the next meeting was discussed freely, Louisville and Washington being considered. On motion of Dr. Geier, seconded by Dr. Hamill, Louisville, Kentucky, was chosen for the next meeting place, the date to be determined later by Council.

The nominations by Council of officers for the ensuing year resulted as follows:

For President, Henry Enos Tuley, Louisville, Ky.

For Secretary, Otto P. Geier, Cincinnati, Ohio.

For Treasurer, Samuel McC. Hamill, Philadelphia, vice A. W. Myers, resigned.

For member of Council for five years, J. J. Thomas, of Cleveland, Ohio.

Council submitted the above candidates for election.

Adjourned.

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Dr. Cameron: "The motion has been made that the secretary cast the vote for the Association for the names submitted."

Motion carried. Secretary has cast the ballot.

Request made that the secretary read the duties of the Council.

Duties of Council read.

Dr. Little, of Brooklyn, N. Y.: "In the suggestions of Mr. Haney and Dr. Davis I think some of us find food for thought, especially in the matter of better newspaper publicity. The question of publicity is an important one. I think we are bashful about too much advertising, yet in this case modesty is bad business, because publicity on Certified Milk means the saving of the lives of the babies. There are tens and hundreds of thousands of families in the country that would buy Certified Milk if they knew what it meant, and how important it was. The thing is not properly advertised. Never has been. It should be, for the good of the country, since the babies of to-day will control the nation a generation from now, and if they do n't get good food the country will be badly run.

"The County of Kings has just issued a circular which the dealers are authorized to send out, and four or five of them in the last month have sent out to consumers 35,000 copies. That is one way of getting at publicity by circularizing people, telling them what Certified Milk is. I have some copies of this circular which I will leave on the secretary's desk in the hope that some other representatives of Commissions will look it over, and at the next session suggest improvements, and in the meantime advertise as much as possible themselves.

"As to the matter of newspaper publicity, it seems to the Commission of the County of Kings a thing to be desired. One of the speakers called attention to the fact that the Philadelphia newspapers were giving almost no space to this important session. They would have done so if some special Committee had been looking after the city editors. If it is in order, I think we should appoint a Committee on Publicity, to consist of three or five members, and that such Committee

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communicate with the various Commissions, asking them to appoint their own Committees upon Publicity, the Committee of this Association to supervise the work of the local committees."

President Rosenau: "The motion has been made that a committee of three be appointed on publicity for the purposes mentioned."

Motion seconded and carried.

"I assume that that Committee will be nominated by the Council, the same as all other Committees, for the approval of the Association."

Dr. Cameron: "We have talked of standards along a good many lines, but I believe there is one standard in Milk Commission work that has never been touched upon, and that is business methods in the Commission. I would like to have some of the members tell us about their business methods, because, after all, the success of the Commission is in the financial success."

Question overruled by Dr. Rosenau on account of the shortness of the session and the amount of work to be done. Dr. Cameron referred to the latest report of the A. A. M. M. C. just recently published.

ADDRESS OF THE PRESIDENT.

M. J. Rosenau, M. D., Boston, Mass.

"I will not read the paper I have prepared, because it is in large part a repetition of what has been discussed at these meetings. The gist of my presidential address is contained in the resolutions which the Council recommended to-day, and which the Association unanimously passed—and that is to establish the fact definitely, once and for all, that Certified Milk is the very freshest milk, the very best milk, the very safest milk, in fact, milk of the highest quality that it is possible to produce. Such milk only may be called certified, and none other. That is the standard, I think, to which this Association

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must adhere. Perhaps its work will be somewhat limited, but it will have perfectly definite aims, toward which it may strive.

"I would like to state that it is an honor to be associated with any movement which represents such high ideals. It is easy enough to set ideals, it is a very different and frequently a difficult matter to live up to them. Now here we have an ideal that is an accomplished fact. It has actually been put into practice, and some of the producers of Certified Milk have outscienced the scientists, that is, they have done what the scientists and the laboratory men have considered an impossibility. We have makers of Certified Milk, Mr. S. L. Stewart (Newburgh, N. Y.) for instance, who produce milk in large quantities practically free of bacteria. Now ten years ago I would have said from the knowledge of the subject I had at that time that this was an impossibility. Here is an achievement of which we can all be proud.

"The name, 'Certified Milk,' to my thinking, lacks a certain amount of charm and attractiveness, which does not bid well for its popularity. However, that need not seriously worry us. We know perfectly well that the term of itself is not explanatory, it must be defined, and no single word is inclusive enough to tell the whole story. Sometimes Certified Milk is called babies' milk, but that is only one of the objects of Certified Milk. Babies and invalids must have clean, pure, fresh milk. We have often heard that Certified Milk is milk for the rich. It is my experience that it is not the rich people especially who buy Certified Milk—perhaps that is one reason why they are rich.

"There is considerable danger to our cause in the abuse and misuse of the term 'Certified Milk.' We have taken one of the most important steps toward the protection of that name, and toward the protection of those producers who have obtained the distinction of being admitted into the honor class by defining 'Certified Milk' and by excluding all those who do not live up to the requirements.

"Probably you are all familiar with the situation in Rhode Island. In Rhode Island a Milk Commission, that is, a Certified Milk Commission, was formed some years ago. A Cer-

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tified Milk Producer was recognized. He produced Certified Milk, but he failed to maintain high standards, and was dropped. He went to the Legislature and obtained an enactment to call his milk Certified Milk, and to-day this man is authorized by the law of his State to sell Certified Milk, although I am told that his milk is not as good as much of the ordinary milk that is found upon the market. Here evidently we have one of the functions of this Association clearly defined to correct abuses of this nature.

"Another instance showing the lack of co-operation between Certified Milk Commissions, is the fact that the Certified Milk produced at Amherst at the Massachusetts Agricultural Station is certified by one of the Boston Commissions, but is not recognized as Certified Milk in the neighboring towns of Cambridge and Malden.

"We need co-operation and reciprocity. The adoption of uniform standards and methods will go far to accomplish these ends.

"Just a word about the Medical Milk Commission itself, which is not without its sins of commission and omission. I can not speak about all the things that the Medical Milk Commission commits and omits, but a few of them, I think, point a very useful lesson. Every once in a while the Medical Milk Commission finds that something is going wrong, and then it jumps on the producer. Now the producer does his best to cure the trouble. Often it is not easy to lay the finger on the trouble—why the counts have gone up—why the fats are too high or too low. In his perplexity the producer comes to the Commission for guidance and help, and in certain instances, and I know this to be true, the Medical Milk Commission says to the producer, 'That is not our business—it is your business to make Certified Milk, it is our business to see that it is done.' In my judgment that is a very unfortunate attitude for any Medical Milk Commission to take. The Medical Milk Commission should co-operate in a friendly and helpful spirit with the producer, help the producer over his perplexity and out of his trouble. So long as the producer is honest and conscientiously strives to produce Certified Milk, the Medical Milk

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Commission should give him a helping hand. Just as soon as dishonesty is found, there is only one thing for a Medical Milk Commission to do, and that is to take away the rights of such producer to use the term 'Certified Milk,' because after all we have to recognize the producer as the most important person in this movement. He is the man behind the gun. We have to encourage producers to come into the fold and stay in after they are in, and to maintain the high standards which have been set, and which we expect.

"A word about the middleman. It seems to me that the middleman or large contractor is inevitable in the milk business—that is, at least in the general market supply of milk for large cities, but for some reason or other the middleman is a brake upon the Certified Milk wagon. The certified producer is therefore forced often at considerable economic loss to distribute his own milk.

"So far as the certificate is concerned, is it evident, as has been told at these meetings, that there is no use certifying milk and issuing certificates unless the certificate means exactly what it says? Sometimes the certificate is abused. One of the troubles about the certificate is the date. The greatest care should be taken concerning these certificates and their dating. The dates on the certificates that I have seen are sometimes practically worthless. Perhaps it will just say 'Tuesday,' but whether it means that the milk was obtained on Tuesday, or marked on Tuesday, or sold on Tuesday, or to be used on Tuesday we can not say, and who can say whether it was this Tuesday or last Tuesday. Sometimes the certificates state that the milk should be used on Tuesday. It seems to me that the certificate should always be dated, and that the only date that is of any real value is the date on which the milk was obtained from the cow. If Certified Milk is to be anything, it must be fresh milk. If we date the certificate when the milk is produced that may be a hardship on certified farmers who live a distance from the large cities, but that is a geographical handicap from which they must take the consequences as a result of their location. The consumer is entitled, in my judgment, to know when the milk was produced.

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Perhaps one of the mistakes that Certified Commissions made is too great insistence upon non-essentials. As far as I can see the problem, it makes very little difference whether the manure pile is twenty or thirty feet from the milk house, just so long as it is not a nuisance or a menace. Nor does it matter very much whether the milk house is fifty, thirty, or ten feet away from the barn, just so long as there is no evident connection to favor contamination or infection. Commissions would do well, I think, in not being too insistent upon points that are not very essential, and, furthermore, Milk Commissions should not be too insistent upon problems of animal husbandry. When we look into this subject, there are really two distinct sides to this problem—one is animal husbandry, and the other is the medical question. There are problems in animal husbandry which have very important relations to the medical problem, but there are a great many instances in which the farm and the herd are vitally concerned that do not make much difference as far as the finished product is concerned, so the Commission would do well to leave to the farmer the things that are the farmer's.

"This is hardly the place to speak of the medical profession, but from the very beginning, when Dr. Coit started the thing, it was a medical movement, it is presided over by a Medical Commission, and the medical idea is the central idea of the entire problem, therefore the medical profession has a very wide responsibility in this matter. It should be better informed what Certified Milk is and its uses, and should be, perhaps, a little less bashful in recommending its use to their patients and friends.

"The work, the aims, and the good results of this Association need not only more publicity of the kind we have heard this morning, but also need the work of a paid secretary to do the chores. We have imposed now five years upon Dr. Geier, and many more upon Dr. Coit. The other officers of this Association have done their share to help the good movement along. It is evident that it is moving, but moving slowly. Progress of a material kind, such as starting new Commissions and regulating those we have, can best be advanced by paid

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assistance. This has been found to be the experience in all movements of this kind. Personally it does not worry me to see that this Association is small, it does not worry me at all to know, as we all know, that the amount of Certified Milk is very small, less in fact than one per cent of the total supply, because it is not quantity we are after, but quality.

"I am now associated with a movement, the training of health officers, which will probably have a slow development. Harvard now offers a degree of Doctor of Public Health to those who qualify. The renaissance of public health is at hand. The sanitarian has information to give away. The day of the efficient health officer and effective sanitation is at hand. The ideas are taking hold slowly upon the public mind, and although the movement may crawl I am satisfied that in time a condition will be reached which I see clearly in my mind. It will be a time when communities will be willing to spend more money for health protection than for fire protection or police protection. Health work and politics will be divorced. The health officer will know what to do and will be furnished the ways and means with which to do it. The Certified Milk movement is part of this awakening of the sanitary conscience of the people. As long as Certified Milk is good reliable milk there will always be a place for it. While the amount of Certified Milk may be small and the membership of this Association may be few, the influence is bound to be very large."

A MICROSCOPIC TEST FOR HEATED MILK.

**By W. D. Frost, Ph. D., Associate Professor of Bacteriology,
University of Wisconsin, and Mazyck P. Ravenel, M. D.,
Professor of Bacteriology, Director State Hygienic
Laboratory, University of Wisconsin.**

Heated milk can be differentiated from raw milk only when it has been subjected to a temperature of 178° F. (80° C.). This differentiation can be made by means of the Storch test. There is no readily applied test for milk heated at the ordinary pasteurizing temperatures, 145-160° F. It is very desirable,

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however, to determine whether or not milk has been heated to these temperatures. This necessity is especially urgent in the control of pasteurization. The fact that there is no such test has made sanitarians question the value of pasteurization as a means of protecting a milk supply. The effect of heat in destroying the cream line, the danger of imparting a permanently cooked flavor, and the uncertain value of the "flash" machines in uniformly heating the milk, are real reasons for doubting the value of commercial pasteurization unless it can be definitely and easily controlled.

The planning of ways and means for the control of large supplies in a proposed undertaking led one of us (W. D. F.) to seriously consider the possibility of devising a method of microscopical examination. It was soon realized that there is one definite effect of efficient pasteurization, and that is to kill the contained living cells. The bacteria are largely destroyed, otherwise pasteurization is inefficient. If the bacteria are destroyed in a vegetative condition, then, it was reasoned, the leucocytes, since they are less protected by a rigid cell wall, would also be killed. The difference between dead and living protoplasm in these rather large cells ought to permit of detection.

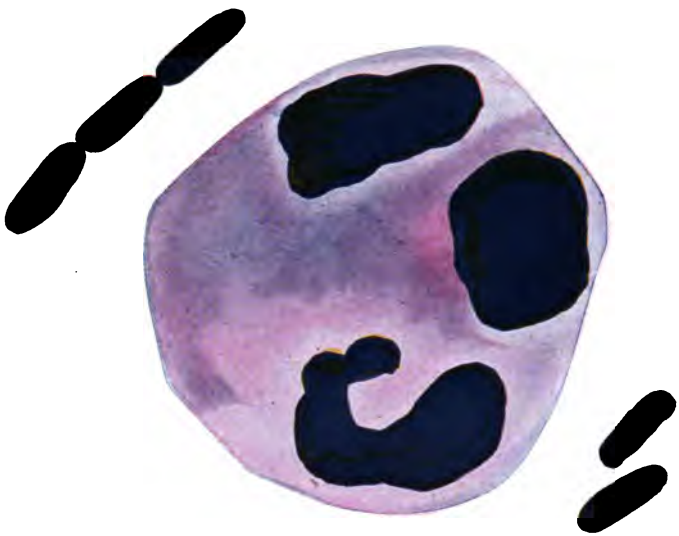
The problem was attacked in an experimental way by a study of the effect of variously described *inter vitam* stains.

While this work was being planned for our attention was called to a stain claiming to differentiate living from dead bacteria. (Proca, Comptes Rendus de la Société de Biologie, 1909, p. 148.)

For some weeks now work has been carried on with both the leucocytes and bacteria. This work has been prosecuted under our direction largely by Miss Lucy Wells Fox and Mr. Casper I. Nelson, seniors in the University. Much credit is due them for their unflagging interest and patient persistence.

Proca's stain is a combination of Ziehl's carbol fuchsin and Loeffler's methylene blue, diluted with distilled water. This stain acting on living bacteria imparts to them a decided blue color in contrast to the color of the dead cells and other material on slide which take the fuchsin.

UNHEATED MILK



HEATED MILK



PROCA'S STAIN

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If this stain is applied to milk in which it is desired to determine the condition of the bacteria it is necessary to add the stain and make the examination without fixing, i. e., the examination must be made so that the bacteria will be killed during the process of staining. A preparation from milk containing living bacteria shows them bright blue in color. If the bacteria are dead they are all stained with the fuchsin.

In the experimental work on leucocytes a number of stains commonly used as *inter vitam* stains were tried. Safranin gave the greatest promise, and has thus far been used almost exclusively. The formula used at first was the one suggested in Lee's *Vade Mecum*, which is as follows:

1 gram Safranin.

100 c. c. Absolute alcohol.

200 c. c. Distilled water.

Later indications are that a saturated aqueous solution containing only a few drops of alcohol is preferable. This stain is applied to the leucocytes while they are suspended in the milk and before they are fixed. This is done by centrifugating about 10 c. c. of milk, removing the cream layer and then the milk, leaving only about half a cubic centimeter with the sediment. This sediment is then stirred up and an equal amount of the stain added. In from seven to ten minutes several drops of the mixture are transferred to glass slides and spread as in the case of opsonic index determinations after the Wright method. When a microscopical examination of such slides made from freshly drawn milk is made the leucocytes are only slightly tinged, although in reality it is necessary to refer to the effect on the different classes of leucocytes separately.

The poly-morpho-nuclear leucocytes are the most abundant in milk and their protoplasm is tinged by this method of staining. The nuclei remain uncolored. The small mononuclear leucocytes (or lymphocytes) take the stain, the nuclei being stained a deep safranin color.

The large mononuclear leucocytes may or may not be stained. The important point in this connection is that in the poly-morpho-nuclear leucocytes the protoplasm is tinged, while the nuclei remain essentially unstained.

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If similar preparations are made from milk in which the cells have been killed either by the application of heat, chemicals, or by long standing, the microscopical picture is quite different. The nuclei are deeply stained and appear as brownish red, while the protoplasm of the cells is much lighter in color. The difference is shown in the accompanying drawing.

The differences indicated appear to be constant and dependable. When a series of samples of raw milk are heated to different temperatures, from 60° C. up, for twenty minutes, and stained immediately thereafter, it is found that the leucocytes appear dead only after exposure to a temperature of 70° C. or more, but when similar samples are heated, cooled, and allowed to stand for some time the change is well marked at 60° C. This might be expected since it probably takes some time for temperatures only slightly above the coagulation point of protoplasm to bring about the physical changes upon which the action of these stains probably depends.

Chemicals, such as mercuric chloride and formaldehyde, produce similar changes in the milk and hence the characteristic staining reaction.

The result of our experiments so far indicate that certain stains will enable us to detect with accuracy the difference between heated and unheated milk, and unless further experiments disclose difficulties not yet discovered we may hope that the method will be a practical and useful one.

E. C. Levy, M. D., Richmond, Va., presented a paper on "Four Years of Dairy Inspection in Richmond, Va.," not submitted for publication.

Dr. Whitaker, Dairy Division, B. A. I., Department of Agriculture: "I want to call especial attention to the charts which Dr. Levy has brought with him, and emphasize them for one reason. The Dairy Division has been instrumental in establishing a score card system of dairy inspection in many places. This has resulted in increasing attention to milk supplies and great improvement. In the march of progress bacteriological inspection has also come to the front and some bacteriologists are carrying it so far as to unduly magnify the

HEATED MILK



UNHEATED MILK



SAFRANIN

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importance of the bacteriological end of the work. One bacteriologist went so far as to say to me one day that he thought our system of inspecting dairies and scoring them was absolutely worthless and a waste of time and money; he said that if he had his way he would do away with all such routine, and would allow milk to be produced in any way any producer would care to produce it, simply requiring that when the milk gets into the city to the consumer it must have below a certain number of bacteria. Speaking in a general and broad way, you see from these charts that there is a similarity between the scoring and the bacterial examinations. Score cards are especially educational and therefore helpful to the producer, and sometimes prevent conditions which would cause high bacterial counts. Hence, it seems that the ideal inspection is where the two systems go hand in hand."

MILK AS A CARRIER OF INFECTION.

**E. C. Schroeder, M. D., Superintendent of Experiment Station,
U. S. Department of Agriculture, Bethesda, Md.**

So much has been said and written in recent times about milk as a carrier of infection that it is difficult to know how to handle the subject in a short address, unless it is to make a somewhat categorical statement of facts. But even the facts have become so numerous that it would take more time to present them properly in the barest form than we have at our disposal.

When I review the conditions on which the dissemination and propagation of the commoner infection diseases depend, I mean those that are not due, like malaria, yellow fever, etc., to the introduction of infectious material into the bodies of their victims by insects and other living carriers, it seems to me that two causes stand out with conspicuous prominence, and these two causes are, first, and no doubt the more important, direct contact between healthy, susceptible persons and those from whose bodies disease germs emanate; and, second, indirect contact of such healthy with more or less diseased

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persons through the agency of a substance in which disease germs can multiply and which is commonly used as food without previous exposure to a germ-destroying process, like cooking.

Leaving direct contact out of consideration, as that does not concern us to-day, let us inquire what the character of a substance should be to give it the highest efficiency to serve the pernicious purpose of a carrier of bacterial infection.

1st. It should be an article of food, as that insures the introduction of the infectious material it may contain into vulnerable, living bodies. Milk is an article of food of so much importance that it is no exaggeration to say that it is more nearly indispensable under the conditions of our modern civilization than any other article, if we omit such essential substances as air and water.

2d. It should be an article of food that is extensively used. The use of milk, as a beverage and in the form of products like cream, butter, and cheese, is more extensive than that of any other article of food.

3d. It should be an article of food that is frequently used in a raw state, as this will insure that the infection it contains reaches its victims alive and virulent. Milk and its products are more commonly used in a raw state than otherwise.

4th. It should be a good culture medium for the multiplication of bacteria, because it is questionable whether the disease germs that are deposited on articles of food under ordinary conditions are sufficiently numerous, unless they have an opportunity to multiply, to play the rôle of important factors in the causation of diseases. Milk is a culture medium for bacteria of such excellence that it is currently used by bacteriologists as one of the very small number of natural, or not specially compounded, substances in which they grow the bacteria they study. How readily and rapidly bacteria grow in it may be judged from the following statement made by Dr. Milton J. Rosenau, on practically unimpeachable authority, in Bulletin No. 56 of the Hygienic Laboratory of the Federal Public Health Service: "It will almost always be

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observed that milk when it is consumed is richer in bacteria by far than the sewage of our large cities."

5th. It should be a fluid, because the germs that are deposited on solids are hampered in their multiplication by the formation of fixed colonies, in which most of them are crowded away from contact with the nutrient surface from which the material for their multiplication must be drawn. In a fluid the germs are bathed on all sides by the food required for rapid and unhindered reproduction. Milk is a fluid and an ideal fluid for this purpose.

6th. It should be an opaque fluid, because the multiplication of bacteria in a transparent fluid would soon become apparent in the form of an unnatural turbidity, or sediment, or both, which would serve as a warning against its use as food. Milk is an opaque fluid, which may contain more than a million bacteria per drop, and commercial milk of this degree of contamination is not altogether uncommon, without the least visible or sensible evidence of their presence.

7th. It should be a fluid that is not perceptibly altered by the presence of disease germs in it, else persons of ordinary intelligence could be taught the changes that occurred, and thus be given the means to protect themselves against the dangers they would signify. Typhoid fever and diphtheria bacilli may become very numerous in milk without perceptibly altering its general appearance, taste, or odor, and the germs that are responsible for a large proportion of the lamentably common abdominal diseases that help to make the death rate among infants higher than it is at any other period of life excepting extreme old age, likewise grow profusely in milk and become very numerous in it without changing its character in a way that will make an impression on our unaided senses.

8th. It should be a substance that can not be tested quickly and effectually relative to its purity and freedom from germs of disease; that is, a substance which is ordinarily used as food before it can be tested sufficiently to insure its wholesomeness. The time required to test milk as to its freedom from disease causing bacteria, or even its general purity, unless it is ex-

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ceptionally filthy or heavily adulterated, is so long that the detection of danger must, as a matter of sheer necessity, be delayed until it is too late to protect its consumer. The detection of dangerous bacteria in the milk from some dairy or dealer, by justifying the assumption that their presence at one time indicates that they will be present continuously or at least periodically, unless the dairy or dealer use active corrective measures, aids us in preventing an addition of victims to victims, but does not give us the means, in any case, to save the first sufferers from becoming victims.

We see from this summary that milk is not only exceptionally adapted in its character and use to serve the purpose of an agent for disseminating and multiplying infectious material, but that it is nearly an ideal agent for this purpose, and, consequently, we have little reason to be surprised when we learn that hundreds of epidemics of typhoid fever, diphtheria, scarlet fever, sore throat, etc., have been traced directly to infected milk, or when we contemplate the fact that the studies made by the United States Public Health Service on the sources of typhoid fever in the District of Columbia proved that ten per cent of all typhoid in the capital city of our great nation must be charged to milk-borne typhoid bacilli.

Now, the important question is how the disease germs that may attack human health get into milk. The germs may be said to be of two kinds, or those derived from the bodies of lower animals and those derived from the bodies of persons.

The specific infectious diseases of importance to human health that occur among animals used for the production of milk are not very numerous. Among them tuberculosis has the highest rank and I believe will be given special attention in another address or paper. Foot and mouth disease fortunately does not exist in our country; cow pox is a disease against which those who have been properly vaccinated should be and probably are immune, but the milk from animals affected with it is not an appetizing article of food and should be eliminated from use; actinomycosis is transmissible to man, but I do not believe that a case in a human being has ever been traced to the use of infected milk; rabies is also

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transmissible to man, but, if rabid cows usually act as the few I have seen acted, there is no danger that milk infected with the virus of rabies from the bodies of dairy animals will reach the market, unless it is from cows in the incubative stage; anthrax, when it occurs among cows, is of considerable importance, because its spore-forming bacillus is difficult to kill and has a wide range of activity relative to the number of different species of animals, including the human, it can attack; specific milk sickness has become so rare that it need hardly be mentioned, and Malta fever was fortunately kept out of the country by the watchfulness of the Federal Bureau of Animal Industry and is a danger principally of goats' and not of cows' milk.

What the deleterious effects are that may be caused by the use of milk from cows affected with various sporadic diseases like pneumonia, enteritis, gastritis, etc., or from various septic, inflammatory conditions, is not well known, but it would be wisdom, to say the least, to absolutely eliminate the milk of all visibly diseased animals from use as human food.

It is very regrettable that many cows in our dairy herds have defective udders. Acute udder disease certainly should be sufficient cause for discarding the milk of a cow, and I, for my part, strongly object to the use of milk from cows affected with chronic udder disease, even though this is manifest only by one dry quarter or the presence of a few hard lumps or nodules.

The germs that enter milk from diseased dairy animals may be derived directly from their bodies or from their environment; hence, in addition to stopping the use of the milk from diseased cows we should insist on their immediate removal from dairy herds, and their complete and continued segregation until their health is restored. Such isolation, in addition to protecting the milk supply, is a reasonable, economic practice, which will often prevent the spread of disease to other animals or the possible infection of the entire herd.

There are some experimental observations to which I wish especially to call your attention, because of the serious im-

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portance with which they impress me. Several years ago my assistant at the Experiment Station of the Federal Bureau of Animal Industry, Mr. W. E. Cotton, and I observed that a considerable percentage of the guinea pigs injected with milk from the Washington City supply to test the frequency with which it is infected with tubercle bacilli, became affected with a curious disease, which somewhat resembled tuberculosis in its gross pathological appearance.

We soon discovered that the disease was inoculable from guinea pig to guinea pig, and hence tried, long without success, to obtain cultures of the organism we assumed to be its causative agent. Tissues from guinea pigs that contracted the affection through inoculation with milk invariably caused the disease in other guinea pigs inoculated with them, and sub-inoculations from the latter guinea pigs were likewise productive of the disease.

The matter mystified us for a long time, and was made particularly interesting by the discovery of a cow at the Experiment Station, the milk of which caused the disease in all guinea pigs inoculated with it. Renewed trials with specially modified culture media finally gave us a delicate growth in our culture tubes. The growth was found to be due to a Gram-positive, non-acid-fast, very small, comparatively short bacillus. This germ, inoculated in the form of pure cultures into guinea pigs invariably produces the disease and can be recovered from their tissues; it also produces the disease when it is fed suspended in milk to guinea pigs, so that our work on the subject, which is not yet complete, has gone far enough to enable us to say that the bacillus is certainly the cause of the disease in guinea pigs.

We now have half a dozen cows at the station that secrete milk infected with the bacillus, and it is in their milk even when this is drawn with the utmost precaution against contamination from any source but the interior of the udder. We have found that about five per cent of the samples of Washington City milk we have examined contains the bacillus; we have tested one large herd of dairy cows, numbering about

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150 animals, in the District of Columbia, and have found that about ten per cent of the cows in this herd secrete milk infected with the bacillus, but we have not yet been able to detect anything about the cows from which the infected milk is obtained that would justify the conclusion that they are not healthy. So far, we have had the opportunity of examining only one cow post mortem that gave milk during her life that contained the bacillus; the post mortem examination revealed no disease of the udder, and only slight lesions of the liver, which will have to be more carefully studied before we can say anything about them.

The bacillus, from our present point of view, seems to have been overlooked in the past because it does not grow on ordinary culture media and because it is very chronic in its pathogenic action on guinea pigs, causing practically no marked changes until after six weeks or more. The changes, however, that are ultimately caused, are tremendous. The spleen is enormously enlarged and more or less nodular, frequently from twenty to thirty times the normal size; the lymph glands are enlarged, oedematous, and show areas of degeneration; the liver is swollen and thickly sprinkled with necrotic areas; in male guinea pigs the testicles are very often completely broken down, etc.

Two conditions caused by the bacillus are especially noteworthy; one is that it occasionally causes paralysis in guinea pigs, and the other that it at times causes a peculiar joint disease. Neither the paralysis nor the joint disease has been observed in any one of the many times more numerous guinea pigs at the Station that have not been infected with the bacillus. The joint disease is particularly interesting, because, bacteriologically, it is associated with a micrococcus, thus foreshadowing the possibility of a micro-organism that can cause disease of the bones and their articulations in the presence of our bacillus, though it may be harmless when the bacillus is absent.

What the importance of this seemingly new bacillus is for public health is still an unsolved question, on which time may

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throw some light. Just at present it is interesting because it proves conclusively that germs, pathogenic for guinea pigs, which no system of inspection, applied to dairy cattle, dairy barns, milk utensils, etc., can detect or eliminate, are of fairly common occurrence in milk, and are evidently directly traceable to the interior of the udders of seemingly healthy cows. The ordinary methods for determining the number of bacteria in milk would indicate that the milk was sterile if it contained no other germs than the bacillus under discussion, even if the number of the bacilli in the milk reached far up in the millions. The thermal death point of the bacillus is 60° C. (140° F.) maintained fifteen minutes.

But we can not discuss this subject further, because our time is limited and we must give some attention to the infectious material that may be introduced into milk from human disseminators of disease germs. And here we have several classes of persons to deal with.

1st. Persons who are actively and visibly affected with infectious diseases.

2d. Persons who have been in contact with actively diseased persons.

3d. Persons who, because of their high but not quite perfect resistance to infection, have such mild attacks of disease that they are regarded as merely a little indisposed. So-called ambulant cases of infectious disease are not altogether uncommon.

4th. Persons in the incubative stage of infectious diseases, or those who expel disease germs before it is recognized that they are diseased.

5th. Persons convalescent from infectious diseases, but who still continue to expel disease germs.

6th. Persons who become chronic carriers of disease germs like "Typhoid Mary" and "Typhoid John," both of whom have been widely discussed in the daily papers.

From any and all of these persons milk may become infected directly or indirectly, when they are permitted to come into contact with it directly or indirectly at any stage of its

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preparation or distribution. Such persons may, and no doubt do, serve as dangerous agents for the infection of milk when the various discharges from their bodies are carelessly allowed to be deposited where they may contaminate the water with which milk utensils are washed, or when the discharges may soil and infect substances which can adhere in one way or another to the cow's body and from it drop into the milk pail.

When we remember what an excellent culture medium for bacteria milk is, it is not necessary to point out that a very meager number of typhoid germs, for example, in the well that supplies the water for a dairy, may cause the milk from the dairy, before it is consumed, to become a fluid charged with uncountable millions of typhoid germs. The same is true of milk utensils that have been exposed to sick persons or in sick rooms and afterwards used for milk before they have been effectually sterilized, or if disease germs, originally from human sources, drop from the sides of a soiled cow into a milk pail, or get into a milk pail from a contaminated, dust-laden atmosphere or otherwise.

Much more could be said on this important phase of milk infection, but I fear I have already exceeded the time allotted me.

DATA REGARDING OPERATIONS OF INFANTS' MILK DEPOTS IN THE UNITED STATES IN 1910.

**By J. W. Kerr, United States Public Health and Marine
Hospital Service.**

In previous compilations regarding infants' milk depots in the United States facts were presented which indicated briefly the extent of the operations of a majority of those institutions in 1907 and 1909 (a). It was shown that there is a great lack of uniformity of action in the several institutions, and for this reason the data collected were difficult of comparison.

(a) Bul. No. 41, Hygienic Laboratory, U.S. Public Health and Marine Hospital Service. Public Health Reports, Vol. XXV, No. 39, Sept. 30, 1910.

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While the general object of all the depots from which data were received is the protection of infant life, there is difficulty in determining in every instance whether it is the endeavor to accomplish this by meeting the purely hygienic needs of infants, or by simply relieving the distress brought about by poverty.

Poverty is undoubtedly a most important factor in the production of infant morbidity, and in consequence imposes additional responsibilities on communities in which it exists. In meeting these responsibilities milk has been provided by charitable organizations and others, as well as by regular milk dispensaries.

Desirable as it would be to ascertain all the avenues through which milk is furnished to needy infants, and the number thus supplied, it has been found to be impracticable thus far to do so. There are undoubtedly many organizations which furnish both milk and instructions to families in connection with other philanthropic work, but the facts regarding such organizations are not at hand, and if they were, would not properly be comparable with those from infants' milk depots which are established to fulfill a specific function and operated under medical supervision.

With the view of securing further data from these latter institutions, blanks were used similar to those in the previous compilation, the questions contained therein having been formulated by a Committee of the American Association of Medical Milk Commissions, the members being Drs. H. L. Coit, Rowland Freeman, and the writer.

Every effort has been made to secure data from all the institutions engaged in dispensing milk under medical supervision to infants. As was the case in the previous compilation, however, it has been impossible to secure data from all of the known institutions, and this accounts for the lack of reference to several of the more important ones that are mentioned in previous reports.

It is desired here to acknowledge the assistance of those who furnished data. Without such assistance this report

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would be impossible, and it is a matter of regret that lack of space prevents individual mention of those to whom credit is due.

Data were received from forty-one institutions located in thirty cities. In addition, communications were received from health authorities regarding general measures for the protection of infant life, one of these, for example, being from Dr. J. S. Neff, Director of Public Health and Charities, regarding the conference on summer work for mothers and infants in Philadelphia. This conference adopted resolutions providing for a plan of co-ordination and co-operation with that Department of all existing agencies, including day nurseries, settlements, and neighborhood social betterment agencies having facilities such as baths, camps, mothers' clubs, milk stations, etc., agencies providing temporary shelter for mothers and children, modified milk stations and hospitals and dispensaries. From this the wide field of operations is apparent, some of them being carried on in regular milk depots.

The following is a list of all institutions from which data were received, their objects, methods of operation, and means of maintenance. The data contained in the following tables relate to the calendar year 1910, except where otherwise specified. (See pages 142 to 147.)

Objects of the Institutions.

Thirty of the institutions mentioned in the above list furnished similar data for previous reports. Four of the twelve remaining institutions are located in cities not previously mentioned, viz., Honolulu, Indianapolis, Ind., Milwaukee, Wis., and Springfield, Ohio, and the objects of all are the prevention of infant morbidity and mortality.

Operation of Institutions.

The work was carried on either through milk stations, hospitals or medical dispensaries, milk station on farm with sub-stations, or dispensing of milk in the homes on physicians' prescriptions or nurses' orders. In addition to dispensing milk, a large number gave particular attention to house visits,

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INSTITUTION.	OBJECT.	HOW OPERATED.	HOW MAINTAINED.
Albany, N. Y.—Central Christian Mothers' Union.	To conduct an infants' milk depot.	By depot and visits.	By the "Union."
Baltimore, Md.—The Babies' Milk Fund Association.	To furnish to mothers who need it, best milk for their babies.	By depot and visits.	
Council Milk and Ice Fund.	To distribute milk and ice to needy persons, and to sell pure milk at nominal prices to reduce mortality	Visits made after certificate from physician; tickets issued for milk and ice, which are delivered at homes.	Appropriation made by Federated Jewish Charities of Baltimore.
Boston, Mass.—Women's Municipal League, Committee on Infant Social Service.	Improvement of health of babies.	Visits by nurses; clinics.	
Chicago, Ill.—Infant Welfare Society (formerly Milk Commission of Chicago).	To supply infants with pure milk at cost or below, from distributing stations	Central pasteurizing and distributing station, and sub-stations.	
Dayton, Ohio.—Milk Commission Montgomery County Medical Society, Free Milk Fund.	Distribution of milk to worthy poor.	Through physicians, charity nurses and organizations.	By contributions and money raised by ball game.
Detroit, Mich.—Detroit Milk Fund.	To educate mothers in the care of infants, and to supply milk to the poor.	By clinics and visits.	By private charity.
Hartford, Conn.—Babies' Hospital, Incorporated.	Treatment of babies under two years suffering with gastro-intestinal diseases.	By a committee.	By voluntary contributions
Honolulu, T. H.—Palama Settlement.	To reduce mortality among infants, and to raise the standard of milk sold in the city.	Distribution of milk, instruction of mothers in care of infants.	By donation and sale of milk below cost.

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INSTITUTION.	OBJECT.	HOW OPERATED.	HOW MAINTAINED.
Indianapolis, Ind.—Pure Milk Commission of the Children's Aid Association.	Prevention of infant mortality.	Distribution of milk, instruction of mothers.	Private contributions and appropriations.
Kansas City, Mo.—Kansas City Pure Milk Commission.	To provide proper milk for infants who otherwise would be unable to obtain it.	Central laboratory and distributing stations.	Subscriptions, donations, and receipts from sale of milk.
Lawrence, Mass.—Lawrence Sanitary Milk Commission.	To supply clean milk, and give instruction in baby hygiene.	By classes of instruction and visits.	By subscriptions.
Louisville, Ky.—Babies' Milk Fund Association.	Distribution of clean milk, scientific feeding of young children, care of sick children, education of poor mothers.	By laboratory, stations, lectures, and visits.	
Milwaukee, Wis.—Visiting Nurse Association, two summer day camps.	See answer to next question	Cares for sick poor in homes for children with intestinal disorders in camps.	
New Bedford, Mass.—The Charity Organization Society.	To furnish pure milk for infants and invalids of the tenement house district during the summer.	Stations maintained, visiting nurse employed.	By private contributions.
Newark, N. J.—The Babies' Hospital Milk Dispensary.	To prevent infant mortality, educate mothers, and teach infant hygiene.	By hospital, dispensary, and nurses.	By voluntary contributions.
New Haven, Conn.—Consumers' League, milk depot.	To furnish pure milk for infants and children up to two years.	By distributing station.	

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INSTITUTION	OBJECT.	HOW OPERATED.	HOW MAINTAINED.
New York City.—Division of Child Hygiene, Department of Health.	To give instruction in baby hygiene and home sanitation.	Lectures, clinics, district offices, care of sick poor.	By appropriation from the city.
Good Samaritan Dispensary.	To furnish pure milk for infants and invalids.	By dispensary and diet kitchen.	For adults by fund raised by dispensary, for children, by fund raised by Mrs. Felix Adler and Mrs. Isaac Adler.
Nathan Straus Laboratory.	To reduce infant mortality by feeding infants proper milk.	By milk depots.	By Mr. Nathan Straus.
New York Milk Committee.	Improvement of milk supply, reduction of infant mortality and educating public to the proper use of milk.	By infants' milk depots (With other means.)	By a private society maintained by voluntary contributions.
Wilkes' Dispensary, Out-patient Department of St. Mary's Free Hospital for Children.	The medical and surgical treatment of infants and children.	By dispensary.	
Peoria, Ill.—Associated Charities.	To preserve life, by giving free medical attendance and nursing, and providing pure milk.	By dispensary and visits.	
Philadelphia, Pa.—Bureau of Health.			
Pittsburgh, Pa.—Department of Health of the City of Pittsburgh.	Distribution of good milk to babies otherwise unable to obtain it; instruction of mothers in feeding and care of babies.	By dispensaries and visits.	By the City of Pittsburgh.

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INSTITUTION.	OBJECT.	HOW OPERATED.	HOW MAINTAINED.
Providence, R. I.—Providence District Nursing Association.	Protection of infant life by education of mothers or those who have care of children.	Through visits at home, clinics, school for mothers, and day camps.	By voluntary contributions, donation days, and aid of Providence Medical Association.
Rochester, N. Y.—Rochester Milk Depots.	Information of mothers and protection of child life.	Central milk station on a farm; five stations in school buildings; each station in charge of a nurse with a visiting nurse on duty.	
St. Louis, Mo.—St. Louis Pure Milk Commission.	Supervision of production of certified milk; furnishing pure milk for infant feeding among the poor; clinical and home supervision of feeding cases.	A laboratory, distributing stations, clinics, physicians, visiting nurses.	By private donations, assisted by St. Louis Provident Association.
United Hebrew Charities.	Distribution of pure milk.	Milk station in connection with St. Louis Pure Milk Commission.	Modified milk supplied by the Milk Commission.
Clinic for Infant Feeding of St. Louis Children's Hospital.	Proper feeding of infants.	Through feeding clinics, with assistance of social service committee of the Board of Trustees.	By efforts of Board of Trustees and Directors of Hospital.
Kingdom House Feeding Clinic, Kingdom House Settlement.	To supply pure and clean milk to babies in congested districts.	By feeding clinic.	By private charity.

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INSTITUTION.	OBJECT.	HOW OPERATED.	HOW MAINTAINED.
Springfield, Ohio. —Baby's Milk Dispensary.	Supply of inspected milk to poor babies.	By out-door camp for infants, education of mothers.	By public subscription.
Washington, D. C. —Nathan Straus Pasteurized Milk Laboratory.	To lessen infant mortality.	Distribution of modified, pasteurized milk in nursing bottles.	By Mr. Nathan Straus.
Washington Diet Kitchen, with baby milk stations situated at Neighborhood House and Noel House.	To distribute food to the indigent.	Through the visiting nurse society; by kitchen and stations.	By subscriptions and donations.
Instructive Visiting Nurse Society of the District of Columbia, Department for the Prevention of Infant Mortality.	To co-operate with the health department of the District of Columbia in the prevention of infant mortality.		By private charity.
Waterbury, Conn. —Waterbury Visiting Nurse Association.	To provide nurses for the sick poor, to furnish milk for sick babies.	By milk station, day camp depots, instruction to mothers.	
Wilkes-Barre, Pa. —Wyoming Valley Society for the Prevention and Treatment of Tuberculosis.	Improvement of the milk supply.	Distribution of milk prepared in laboratory supervised by Society.	
Worcester, Mass. —Worcester Conference on Child Welfare.	To furnish pure milk to children.	By milk stations conducted during summer by the Milk Committee.	By public philanthropy.

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INSTITUTION	OBJECT,	HOW OPERATED,	HOW MAINTAINED,
Boston, Mass.—Milk and Baby Hygiene Association.	To improve milk supply, to prevent sickness and reduce mortality among infants, and to increase health and vitality of children and mothers.	By milk depots, visits and conferences.	By private charity.
Buffalo, N. Y.—Babies' Milk Dispensary of Buffalo.	To reduce infant mortality; to teach and help mothers to improve general milk supply.	By laboratory, distributing stations, consultations, and visits.	By private subscription and sale of milk.
Cleveland, Ohio.—The Babies' Dispensary and Hospital.	To reduce infant mortality by preventive measures.	Central dispensary, branch dispensaries, laboratory and milk stations, consultations and visits, outdoor ward during summer, control of milk farms, supplying milk to nurseries.	
Yonkers, N. Y.—Saint John's Riverside Hospital.	Sale of pasteurized milk, education by literature and instruction.	Milk dispensary and visits.	By the hospital, by subscription and sales of milk.
New York City.—New York Diet Kitchen Association.	To prevent infant mortality, give special attention to cases of tuberculosis, and furnish pure milk to other cases needing it.	By stations, or "kitchens," and visits.	By subscriptions, donations and a small endowment.

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clinics, conferences or lectures, and some, such as the Babies' Dispensary and Hospital at Cleveland, actually conducted outdoor wards or summer camps; educational measures being made an important feature of the work. In certain cities, for instance, New York, Chicago, St. Louis, and Washington, substations were maintained in connection with central depots, thus enlarging the field of operations in those cities. In St. Louis, as will be seen, one institution operates in connection with the Pure Milk Commission, and, in so far as relates to milk distribution, is probably in reality a substation. The same is true in Washington, the Nathan Straus Milk Laboratory having supplied milk through six substations, two of which are located at Neighborhood House and Noel House. The milk stations at these latter institutions are maintained, however, by the Washington Diet Kitchen, and the milk depot at Neighborhood House is operated by the Infants' and Children's Dispensary, the milk being dispensed under the direction of the physician associated with the dispensary. This work was begun in April, 1908, and has been continued since that time. The arrangement, as outlined, represents very well the character of co-operation rendered by charitable organizations, not only in Washington, but in other cities.

How Maintained.

Twenty-nine of the institutions were stated to be maintained by private means, one partly by private means and partly by public appropriations. No information was forwarded on this point regarding the eleven remaining institutions. One of these, which is in Rochester, is believed to be maintained by the Health Department. New York and Pittsburgh are the only other cities known that provided funds for the carrying on of such work.

The following table contains an analysis of the data received regarding measures taken for the education of mothers in infant hygiene, those who gave the instructions and where given:

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INSTITUTION.	SPECIAL MEASURES TAKEN FOR EDUCATION OF MOTHERS IN INFANT HYGIENE?	INSTRUCTIONS GIVEN BY LITERATURE OR BY PHYSICIANS AND NURSES?	IN THE HOMES OR AT CENTRAL CONSULTATIONS?
Albany, N. Y.—Central Christian Mothers' Union.	Yea.	Both.	Both.
Baltimore, Md.—The Babies' Milk Fund Association.	Yea.	By physicians and nurses.	Both.
Council Milk and Ice Fund.	Yea.	By physicians and nurses and friendly visitors.	At the homes.
Boston, Mass.—Women's Municipal League, Committee on Infant Social Service.	Yea.	By physicians and nurses.	Both.
Chicago, Ill.—Infant Welfare Society (formerly Milk Commission of Chicago).	Yea.	By literature, and by visiting nurses and attendants at the stations.	Both.
Dayton, Ohio.—Milk Commission, Montgomery County Medical Society, Free Milk Fund.	Yea.	By physicians and nurses.	At the homes.
Detroit, Mich.—Detroit Milk Fund.	Yea.	Both.	Both.
Hartford, Conn.—Babies' Hospital Inc.	Yea.	Mostly by nurses; literature prepared by Board of Health distributed.	At the hospital.

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INSTITUTION.	SPECIAL MEASURES TAKEN FOR EDUCATION OF MOTHERS IN INFANT HYGIENE?	INSTRUCTIONS GIVEN BY LITERATURE OR BY PHYSICIANS AND NURSES?	IN THE HOMES OR AT CENTRAL CONSULTATIONS?
Honolulu, T. H.—Palama Settlement.	Yes.	Both.	Both.
Indianapolis, Ind.—Pure Milk Commission of the Children's Aid Association.	Yes.	Both.	Both.
Kansas City, Mo.—Kansas City Pure Milk Commission.	Yes.	Both.	Both.
Lawrence, Mass.—Lawrence Sanitary Milk Commission.	Yes.	Both.	Both.
Louisville, Ky.—Babies' Milk Fund Association.	Yes.	Both.	Both.
Milwaukee, Wis.—Visiting Nurse Association, two summer day camps.	Yes.	Both.	In camps and at homes.
New Bedford, Mass.—The Charity Organization Society.	Yes.	Both, but mainly by visiting nurse.	In the homes.
Newark, N. J.—The Babies' Hospital Milk Dispensary.	Yes.	Both.	Both.
New Haven, Conn.—Consumers' League, milk depot.	No.		

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INSTITUTION.	SPECIAL MEASURES TAKEN FOR EDUCATION OF MOTHERS IN INFANT HYGIENE?	INSTRUCTIONS GIVEN BY LITERATURE OR BY PHYSICIANS AND NURSES?	IN THE HOMES OR AT CENTRAL CONSULTATIONS?
New York City.—Division of Child Hygiene Department of Health.	Yea.	Both.	At homes, recreation centers, milk depots, public schools, playgrounds; special lectures.
Good Samaritan Dispensary.	Yea.	By physicians and nurses.	Both, but chiefly at dispensary.
Nathan Straus Laboratory.	Yea.	By literature and physician.	At central consultation.
New York Milk Committee.	Yea.	Both.	Both.
Wilkes' Dispensary, Out-patients Department of St. Mary's Free Hospital for Children.	Yea.	By physicians and nurses.	Both.
Peoria, Ill.—Associated Charities.	Yea.	By physicians and nurses.	At homes and at mothers' meetings.
Philadelphia, Pa.—Bureau of Health.	Yea. ?	Both. ?	Both. ?
Pittsburgh, Pa.—Department of Health of the City of Pittsburgh.	Yea.	Both.	Both.
Providence, R. I.—Providence District Nursing Association.	Yea.	Both.	Both.

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INSTITUTION.	SPECIAL MEASURES TAKEN FOR EDUCATION OF MOTHERS IN INFANT HYGIENE?	INSTRUCTIONS GIVEN BY LITERATURE OR BY PHYSICIANS AND NURSES?	IN THE HOMES OR AT CENTRAL CONSULTATIONS?
Rochester, N. Y.—Rochester Milk Depots.	Yea.	By literature and nurses.	Both.
St. Louis, Mo.—St. Louis Pure Milk Commission.	Yea.	Both.	Both, but chiefly given individually at central consultations.
United Hebrew Charities.	Yea.	By literature and nurse.	Both.
Clinic for Infant Feeding of St. Louis Children's Hospital.	Yea.	By physician and district worker.	Both.
Kingdom House Feeding Clinic, Kingdom House Settlement.	Yea.	Both.	Mostly in homes.
Springfield, Ohio.—Baby's Milk Dispensary.	Yea.	By physicians and nurses.	Both.
Washington, D. C.—Nathan Straus Pasteurized Milk Laboratory.	Yea.	Both.	Both.
Washington Diet Kitchen, with baby milk stations situated at Neighborhood House and Noel House.	Yea.	Both.	Both.

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INSTITUTION.	SPECIAL MEASURES TAKEN FOR EDUCATION OF MOTHERS IN INFANT HYGIENE?	INSTRUCTIONS GIVEN BY LITERATURE OR BY PHYSICIANS AND NURSES?	IN THE HOMES OR AT CENTRAL CONSULTATIONS?
Washington, D. C.—Instructive Visiting Nurse Society of the District of Columbia, Department for the Prevention of Infant Mortality.	Yes.	By pamphlets and posters and by nurses.	Principally in the homes.
Waterbury, Conn.—Waterbury Visiting Nurse Association.	Yes.	By nurses.	Both.
Wilkes-Barre, Pa.—Wyoming Valley Society for the Prevention and Treatment of Tuberculosis.	Yes.	Both.	Both.
Worcester, Mass.—Worcester Conference on Child Welfare.	Yes.	Both.	Both.
Boston, Mass.—Milk and Baby Hygiene Association.	Yes.	Both.	Both.
Buffalo, N. Y.—Babies' Milk Dispensary of Buffalo.	Yes.	Both.	Both.
Cleveland, Ohio.—The Babies' Dispensary and Hospital.	Yes.	Both.	Both.
Yonkers, N. Y.—Saint John's Riverside Hospital.	Yes.	Both.	Both.
New York City.—New York Diet Kitchen Association.	Yes.	Both.	Both.

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Dissemination of Information Regarding Infant Hygiene.

Every institution mentioned took special measures for the education of mothers in infant hygiene. These instructions were given by physicians and nurses or by means of literature or both. Three did this educational work in the homes, two only at central stations and four both in the homes and at central consultations.

The Division of Child Hygiene of the Department of Health of the City of New York also gave instructions at recreation centers, play grounds, public schools, and by means of special lectures. The success attending this work in the schools has been emphasized by those carrying it on, and clearly indicates that the public school is a most important social center from which influences are exerted on practically every family regarding a great variety of subjects affecting the public health. (See pages 155 to 159.)

Agencies that Distribute Milk.

Forty of the institutions mentioned distribute milk, twenty-three of them to infants only and seventeen to both infants and adults. At some depots the milk supplied to adults is for expectant or nursing mothers, thus contributing indirectly to the welfare of the children.

Milk Sold or Given Away.

Of the forty institutions dispensing milk, eight sell it, four additional ones sell it below cost, twenty-three sell to those who are able to pay and given to those who are not, and three give it outright. The sale of the milk appears to be one means of securing funds to extend the work, the price varying from almost nothing to actual cost in the different depots. (See pages 160 to 164.)

Percentage of Children and Adult Beneficiaries.

The beneficiaries were mostly children. Of the thirty-six institutions giving information as to what proportion of the beneficiaries were children, invalid adults, and nursing

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INSTITUTION.	DOES AGENCY DISTRIBUTE MILK TO INFANTS AND INVALIDS?	IS MILK SOLD TO THE POOR OR GIVEN OUTRIGHT?	WHAT PROPORTION OF COST IS CHARGED?
Albany, N. Y.—Central Christian Mothers' Union.	Yes.	Sold, except in needy cases.	Less than one-half.
Baltimore, Md.—The Babies' Milk Fund Association.	To infants only.	Sold below cost.	About 75%.
Council Milk and Ice Fund.	Yeg.	Given.	Full cost.
Boston, Mass.—Women's Municipal League, Committee on Infant Social Service.	Yes.	Sold.	Full cost.
Chicago, Ill.—Infant Welfare Society (formerly Milk Commission of Chicago).	To infants principally.	Usually sold below cost.	40 to 80%.
Dayton, Ohio.—Milk Commission, Montgomery County Medical Society, Free Milk Fund.	To infants only.	Given or sold at half price.	About 12%.
Detroit, Mich.—Detroit Milk Fund.	Yes.	Sold, if person is able to pay.	What person is supposed to be able to pay.
Hartford, Conn.—Babies' Hospital, Inc.	Only in exceptional cases.	Given when furnished at all.	
Honolulu, T. H.—Palama Settlement.	To infants.	Some sold at or below cost, some given.	65%.
Indianapolis, Ind.—Pure Milk Commission of the Children's Aid Association.	Generally infants; occasionally to older invalid children.	Sold.	81.3%.

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INSTITUTION.	DOES AGENCY DISTRIBUTE MILK TO INFANTS AND INVALIDS?	IS MILK SOLD TO THE POOR OR GIVEN OUTRIGHT?	WHAT PROPORTION OF COST IS CHARGED?
Kansas City, Mo.—Kansas City Pure Milk Commission.	To infants only.	Given outright in some very needy cases.	About 50% where it is sold.
Lawrence, Mass.—Lawrence Sanitary Milk Commission.	To infants only.	Given to those unable to pay.	Total cost if person able to pay.
Louisville, Ky.—Babies' Milk Fund Association.	To infants and nursing and expectant mothers.	Sold, given to those unable to pay.	58% cost of modification, 90% cost of whole milk.
Milwaukee, Wis.—Visiting Nurses Association, two summer day camps.	To infants while at camps.	Small charge for night feedings taken to homes.	About one-half.
Newark, N. J.—The Babies' Hospital Milk Dispensary.	To infants only.	Sold, except to a few who are destitute.	Half of the cost.
New Bedford, Mass.—The Charity Organization Society.	Yes.	Sold to those who can pay; given to others.	80%.
New Haven, Conn.—Consumers' League, Milk depot.	Only to infants.	Sold.	About one-half.
New York City.—Division of Child Hygiene, Department of Health.	To infants and mothers who are nursing children.	Sold.	Actual cost.
Good Samaritan Dispensary.	Yes.	Given to adults; to children given and sold.	When sold, 1 cent a bottle, to insure return of bottle.

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New York City.—Nathan Straus Laboratory.	Yea.	Sold at cost to those who can pay, given to others.	Cost, when it is sold.
New York Milk Committee.	To infants up to two years; and longer if baby needs it.	Sold.	Seven-eighths of cost.
Wilkes' Dispensary, Out-patient Department of St. Mary's Free Hospital for children.	Infants and children.	Both.	One-half.
Peoria, Ill.—Associated Charities.	Yea.	Sold; some given to those unable to pay.	?
Philadelphia, Pa.—			
Pittsburgh, Pa.—Department of Health of the City of Pittsburgh.	To infants only.	Mostly given.	When sold, some at cost, some at half cost.
Providence, R. I.—Providence District Nursing Association.	To infants only.	Both.	About one-half.
Rochester, N. Y.—Rochester Milk Depots.	Only to infants.	Sold.	Three-fourths (work of nurses included).
St. Louis, Mo.—St. Louis Pure Milk Commission.	Only to infants.	Given to those unable to pay; sold to others.	About two-thirds.

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INSTITUTION.	DOES AGENCY DISTRIBUTE MILK TO INFANTS AND INVALIDS?	IS MILK SOLD TO THE POOR OR GIVEN OUTRIGHT?	WHAT PROPORTION OF COST IS CHARGED?
St. Louis, Mo.—United Hebrew Charities.	Yes.	Both.	Less than one-half.
Clinic for Infant Feeding, of St. Louis Children's Hospital.	Only to infants.		About two-thirds.
Kingdom House Feeding Clinic, Kingdom House Settlement.	To infants only.	Sold at less than cost.	About one-half.
Springfield, Ohio.—Baby's Milk Dispensary.	To infants only.	Sold, except to those unable to pay.	Charge varies.
Washington, D. C.—Nathan Straus Pasteurized Milk Laboratory.	Yes.	Sold in most cases.	26%.
Washington Diet Kitchen with baby milk station situated at Neighborhood House and Noel House.	Yes.	Both.	About one-half.
Instructive Visiting Nurse Society of the District of Columbia, Department for the Prevention of Infant Mortality.	Yes.	Sold to those able to pay.	About cost.

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INSTITUTION.	DOES AGENCY DISTRIBUTE MILK TO INFANTS AND INVALIDS?	IS MILK SOLD TO THE POOR OR GIVEN OUTRIGHT?	WHAT PROPORTION OF COST IS CHARGED?
Waterbury, Conn.—Waterbury Visiting Nurse Association.	To infants.	Usually sold; given some-times.	Cost of milk, but not of service.
Wilkes-Barre, Pa.—Wyoming Valley Society for the Prevention and Treatment of Tuberculosis.	Yea.	Given to those who can not pay, sold to those who can.	?
Worcester, Mass.—Worcester Conference on Child Welfare.	Yea.	Sold.	Cost, less breakage of bottles.
Boston, Mass.—Milk and Baby Hygiene Association.	Yea.	Sold.	Sold at cost.
Buffalo, N. Y.—Babies' Milk Dispensary of Buffalo.	To infants.	Sold; given to those unable to pay.	Maximum, ten cents a quart.
Cleveland, Ohio.—The Babies' Dispensary and Hospital.	To children.	Sold; given to those unable to pay.	One-half to two-thirds.
Yonkers, N. Y.—Saint John's Riverside Hospital.	To infants (may be used by invalids).	Sold.	?
New York City.—New York Diet Kitchen Association.	Yea.	Sold, except in a few cases.	About six-sevenths.

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INSTITUTION.	WHAT PROPORTION OF THOSE BENEFITED ARE (a) CHILDREN, (b) INVALID ADULTS, (c) NURSING MOTHERS?	WHAT PROPORTION OF THE CHILDREN ARE SICK WHEN THEY FIRST GET THE MILK?	WHAT PROPORTION OF THE CHILDREN ARE WELL WHILE DISTRIBUTION IS IN PROGRESS (a) IN SUMMER? (b) IN WINTER?
Albany, N. Y.—Central Christian Mothers' Union.	All children.	Two-thirds.	
Baltimore, Md.—The Babies' Milk Fund Association.	(a) 95%; (c) 5%.	A large proportion.	60 to 80%.
Council Milk and Ice Fund.	(a) 25%; (b) 65%; (c) 10%	Very small proportion.	
Boston, Mass.—Women's Municipal League, Committee on Infant Social Service.	Almost all children.	None.	?
Chicago, Ill.—Infant Welfare Society (formerly Milk Commission of Chicago).	(a) 99%.	99%.	Not known.
Dayton, Ohio.—Milk Commission, Montgomery County Medical Society, Free Milk Fund.	All children.	Nearly all are sick when first seen.	Exact proportions not known.
Detroit, Mich.—Detroit Milk Fund.	Mostly children.	Majority.	?
Hartford, Conn.—Babies' Hospital, Inc.			
Honolulu, T. H.—Palama Settlement.	All children.	75%	Hospital open only during the summer.

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INSTITUTION.	WHAT PROPORTION OF THOSE BENEFITED ARE (a) CHILDREN, (b) INVALID ADULTS, (c) NURSING MOTHERS?	WHAT PROPORTION OF THE CHILDREN ARE SICK WHEN THEY FIRST GET THE MILK?	WHAT PROPORTION OF THE CHILDREN ARE WELL WHILE DISTRIBUTION IS IN PROGRESS (a) IN SUMMER? (b) IN WINTER?
Indianapolis, Ind.—Pure Milk Commission of the Children's Aid Association.	All children.	About 75%.	Work in summer only.
Kansas City, Mo.—Kansas City Pure Milk Commission.	All children.	About 90%.	Very little sickness through the year.
Lawrence, Mass.—Lawrence Sanitary Milk Commission.	(a) one-half. (b) one-half.	Two-thirds.	About one-third work only in summer.
Louisville, Ky.—Babies' Milk Fund Association.	(a) 97%; (b) 3%	More than 50%.	(a) about 90%; no distribution in winter.
Milwaukee, Wis.—Visiting Nurse Association, two summer day camps.	All babies.	All.	
Newark, N. J.—The Babies' Hospital Milk Dispensary.	All children.	90%.	(a) 90%; (b) 95%.
New Bedford, Mass.—The Charity Organization Society.	(a) 95%; (b) 3%; (c) 2%.	About 10%.	
New Haven, Conn.—Consumers' League, Milk Depot.	All children.		
New York City.—Division of Child Hygiene, Department of Health.	?	10% (estimated).	?

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INSTITUTION.	WHAT PROPORTION OF THOSE BENEFITED ARE (a) CHILDREN, (b) INVALID ADULTS, (c) NURSING MOTHERS?	WHAT PROPORTION OF THE CHILDREN ARE SICK WHEN THEY FIRST GET THE MILK?	WHAT PROPORTION OF THE CHILDREN ARE WELL WHILE DISTRIBUTION IS IN PROGRESS (a) IN SUMMER? (b) IN WINTER?
New York City.—Good Samaritan Dispensary.	(a) five-sixths; (b) one-sixth.	About one-half.	No record.
Nathan Straus Laboratory.	(a) 90%; (b) 1%; (c) 9% (about).	90% in summer; 40% in winter.	(a) 85%; (b) 98% (about).
New York Milk Committee.	See note.*	75%.	(a) 75%; (b) 90%.
Wilkes' Dispensary, Out-patient Department of St. Mary's Free Hospital for Children.	All children.	Two-thirds (about).	One-third (about).
Peoria, Ill.—Associated Charities.	Nearly all children.	Most of them.	?
Pittsburgh, Pa.—Department of Health of the City of Pittsburgh.	Children, 83.6%; nursing mothers, 14.1%; expectant mothers, 2.3+%. All children.	Nearly all.	No distribution in winter.
Providence, R. I.—Providence District Nursing Association.	All children.	All.	
Rochester, N. Y.—Rochester Milk Depots.	A few nursing mothers; rest children.	One-half.	One-half in summer.
St. Louis, Mo.: St. Louis Pure Milk Commission.	All under 3 years of age.	Not known.	?

* Five per cent of the babies are entirely breast-fed; their mothers are supplied with milk to drink. Thirty-five per cent are partly breast-fed; mother and baby are supplied with milk. Sixty per cent are babies dependent entirely on the depot milk for food. No milk is furnished to invalid adults.

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INSTITUTION.	WHAT PROPORTION OF THOSE BENEFITED ARE (a) CHILDREN, (b) INVALID ADULTS, (c) NURSING MOTHERS?	WHAT PROPORTION OF THE CHILDREN ARE SICK WHEN THEY FIRST GET THE MILK?	WHAT PROPORTION OF THE CHILDREN ARE WELL WHILE DISTRIBUTION IS IN PROGRESS (a) IN SUMMER? (b) IN WINTER?
St. Louis, Mo.—United Hebrew Charities.	About 95% are children.	Nearly all sick or improperly fed.	(a) about 75%; (b) 70%.
Clinic for Infant Feeding of St. Louis Children's Hospital.	All children.	Not determined.	Not determined.
Kingdom House Feeding Clinic, Kingdom House Settlement.	All children.	75%.	(a) 25%; (b) 50%.
Springfield, Ohio.—Baby's Milk Dispensary.	All children.	A large proportion.	?
Washington, D. C.: Nathan Straus Pasteurized Milk, Milk Laboratory.	Nearly all children.	57%.	?
Washington Diet Kitchen, with baby milk stations situated at Neighborhood House and Noel House.	Nearly one-half children.	One-seventh.	?
Instructive Visiting Nurse Society of the District of Columbia, Department for the Prevention of Infant Mortality.	About 37% infants.	?	?
Waterbury, Conn. — Waterbury Visiting Nurse Association.	All children.	?	

The American Association of Medical Milk Commissions

INSTITUTION.	WHAT PROPORTION OF THOSE BENEFITED ARE (a) CHILDREN, (b) INVALID ADULTS, (c) NURSING MOTHERS?	WHAT PROPORTION OF THE CHILDREN ARE SICK WHEN THEY FIRST GET THE MILK?	WHAT PROPORTION OF THE CHILDREN ARE WELL WHILE DISTRIBUTION IS IN PROGRESS (a) IN SUMMER? (b) IN WINTER?
Wilkes-Barre, Pa.—Wyoming Valley Society for the Prevention and Treatment of Tuberculosis.	?	?	?
Worcester, Mass.—Worcester Conference on Child Welfare.	Nearly all children.	50%.	Not open in winter.
Boston, Mass.—Milk and Baby Hygiene Association.	(a) 95%; (c) 5%.	None.	When a baby under the care of the Ass'n becomes ill, it is sent to the physician or hospital that referred the case.
Buffalo, N. Y.—Babies' Milk Dispensary of Buffalo.	All infants.	?	?
Cleveland, Ohio.—The Babies' Dispensary and Hospital.	(a) 95 to 98%; (b) and (c) 2 to 5%.	?	?
Yonkers, N. Y.—Saint John's Riverside Hospital.	?	?	?
New York City.—New York Diet Kitchen Association.	40% children under 2 yrs.; 46% invalid adults and children over 2 (about); 14% nursing mothers (about).	?	(a) about 97%; (b) about 98%.

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mothers, in fifteen all were children, in six almost all, in eight from 90 to 100 per cent, in two from 80 to 90 per cent, in three from 40 to 50 per cent, in one from 30 to 40 per cent, and in one from 20 to 30 per cent.

The remainder of the beneficiaries were invalid adults or nursing or expectant mothers; in six institutions from 2 to 14 per cent of the beneficiaries being of the latter class.

Percentage of the Children Sick on Application.

At two of the institutions none of the children were sick when application was first made for milk, at two all were sick, at twenty-two from 50 to 100 per cent were sick, at three very few were sick, and in the reports from the remaining institutions definite data on this point were not given. The figures indicate that the majority of the children were ill, and that the largest field of usefulness of such institutions at the present time is among these patients. At the Milk and Baby Hygiene Association, of Boston, none of the children were ill on application, and when a baby under the care of the Association becomes ill it is sent to the physician or hospital that referred the case.

Proportion of Children Remaining Well While Taking the Milk.

The information furnished regarding the proportion of children that remained well during the distribution of the milk is somewhat indefinite, but indicated on the whole that decided improvement took place.

Since a number of the depots were operated during the summer only, no information could be furnished regarding the proportion of children remaining well during that period as compared with winter. The information from those depots which remained opened throughout the year apparently indicates that a greater number remained well during winter, which was not the case in 1909.

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INSTITUTION.	AVERAGE AGE OF CHILDREN FED.	IS LITERATURE ON INFANT HYGIENE DISTRIBUTED WITH THE MILK?	NUMBER FED DURING PAST YEAR: (A) INFANTS; (B) ADULTS.
Albany, N. Y.—Central Christian Mothers' Union.	2 weeks to 2 years.	Yes.	(a) 54.
Baltimore, Md.—The Babies' Milk Fund Association.	About 6 mos.	No.	1,350 babies.
Council Milk and Ice Fund.	Up to 30 mos.	No.	(a) 75; (b) 248.
Boston, Mass.—Women's Municipal League, Committee on Infant Social Service.	All under 1 year.	No.	(a) 26.
Chicago, Ill.—Infant Welfare Society (formerly Milk Commission of Chicago).	3 weeks to 16 months.	Yes, in 7 languages.	?
Dayton, Ohio.—Milk Commission Montgomery County Medical Society, Free Milk Fund.	About 1 year.	No.	99 children.
Detroit, Mich.—Detroit Milk Fund.	Under 1 year.	Yes.	?
Hartford, Conn.—Babies' Hospital, Inc.			
Honolulu, T. H.—Palama Settlement.	4 months.	Yes.	(a) 130.
Indianapolis, Ind.—Pure Milk Commission of the Children's Aid Association.	Under 1 yr., 35%; 1 yr. and over, 65%.	Yes.	324 children.

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INSTITUTION.	AVERAGE AGE OF CHILDREN IS FED.	IS LITERATURE ON INFANT HYGIENE DISTRIBUTED WITH THE MILK?	NUMBER FED DURING PAST YEAR: (A) INFANTS; (B) ADULTS.
Kansas City, Mo. —Kansas City Pure Milk Commission.	8 months.	Yes.	About 500 babies.
Lawrence, Mass. —Lawrence Sanitary Milk Commission.	All under 2 yrs.; two-thirds under 1 yr.	Yes.	(a) 121.
Louisville, Ky. —Babies' Milk Fund Association.	One-half 1 yr. or under; one-half 1 to 5 yrs.	Yes.	(a) 558; (b) 20.
Milwaukee, Wis. —Visiting Nurse Association, two summer day camps.	?	Very little.	?
Newark, N. Y. —The Babies' Hospital Milk Dispensary.	Six months.	Yes.	(a) 515.
New Bedford, Mass. —The Charity Organization Society.	One year.	A very little.	(a) 140; (b) 21.
New Haven, Conn. —Consumers' League, Milk depot.	From birth to two years.	No.	(a) about 200.
New York City. —Division of Child Hygiene, Department of Health.	Mostly under one year.	Yes.	Not known.
Good Samaritan Dispensary.	From birth to two years.	No.	(a) 1,000; (b) 200.
Nathan Straus Laboratory.	Two days to two years.	Yes.	(a) Average, 2,500 daily; (b) 200.
New York Milk Committee.	One-half under three mos.	Yes.	(a) A daily average of 310.

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INSTITUTION.	AVERAGE AGE OF CHILDREN FED.	LITERATURE ON INFANT HYGIENE DISTRIBUTED WITH THE MILK?	NUMBER FED DURING PAST YEAR: (A) INFANTS; (B) ADULTS.
New York City.—Wilkes' Dispensary, Out-patient Department of St. Mary's Free Hospital for Children.	From one month to twelve years.	No.	?
Peoria, Ill.—Associated Charities.	Under one year.	No.	?
Philadelphia, Pa.—			
Pittsburgh, Pa.—Department of Health of the City of Pittsburgh.	About one year.	Yes.	1,033 Children; 203 adults.
Providence, R. I.—Providence District Nursing Association.	From birth to three years.	Yes.	86 Children.
Rochester, N. Y.—Rochester Milk Depots.	More than three-fourths under one year.	Yes.	(a) More than 500.
St. Louis, Mo.—St. Louis Pure Milk Commission.	Great majority in first year.	No.	1,320 infants in 1909.
United Hebrew Charities.	From one month to one and one-half years.	Yes.	(a) 200.
Clinic for Infant Feeding of St. Louis Children's Hospital.	Most of them under one year.	No.	140 infants since April 1st, 1910.
Kingdom House Feeding Clinic, Kingdom House Settlement.	Four to eight months.	Yes.	(a) 167.
Springfield, Ohio.—Baby's Milk Dispensary.	Under eighteen months.	No.	(a) 37.
Washington, D. C.—Nathan Straus Pasteurized Milk Laboratory.	Under one year; average about eight months.	Yes.	(a) 600 in nine months; (b) No record, very few.

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INSTITUTION.	AVERAGE AGE OF CHILDREN FED.	IS LITERATURE ON INFANT HYGIENE DISTRIBUTED WITH THE MILK?	NUMBER FED DURING PAST YEAR: (A) INFANTS; (B) ADULTS.
Washington, D. C. —Washington Diet Kitchen, with baby milk stations situated at Neighborhood House and Noel House.	Ten months.	Yes.	1353 In all. For 8 months: (a) 361; (b) 610.
Instructive Visiting Nurse Society of the District of Columbia, Department for the Prevention of Infant Mortality.	Under one year.	Yes.	?
Waterbury, Conn. —Waterbury Visiting Nurse Association.	Under twelve months.	No.	?
Wilkes-Barre, Pa. —Wyoming Valley Society for the Prevention and Treatment of Tuberculosis.	Not known.	Yes.	(a) 318.
Worcester, Mass. —Worcester Conference on Child Welfare.	One year.	Yes.	(a) 293; (b) 2.
Boston, Mass. —Milk and Baby Hygiene Association.	Average age at admittance, three and one-half mos.; at discharge, ten and one-half mos.	Yes, at intervals.	
Buffalo, N. Y. —Babies' Milk Dispensary of Buffalo.	?	Yes, furnished by Department of Health.	(a) 213.
Cleveland, Ohio. —The Babies' Dispensary and Hospital.	?	At time of first visit to dispensary.	(a) 3,080.
Yonkers, N. Y. —Saint John's Riverside Hospital.	?	Yes.	?
New York City. —New York Diet Kitchen Association.		Yes.	

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Average Ages of Children Fed.

Of the thirty-six institutions furnishing information as to the average age of the children fed, in the majority the children were under one year of age, and in practically all they were under three years.

Literature Distributed with Milk.

At twenty-eight of the institutions reporting, literature on infant hygiene is distributed with the milk, one of them in seven languages, twelve distributed no literature, and one but little.

Number of Persons Fed.

The data received indicated that twenty-eight institutions fed a total of about 13,320 babies, and two additional institutions fed daily about 2,500 and 300, respectively. In addition, seven institutions fed a total of about 894 adults, presumably invalids and nursing or expectant mothers.

In addition also the Milk and Baby Hygiene Association, of Boston, supervised the feeding of 1,870 children, 402 of whom were stated to be breast fed, 554 partially breast fed, 875 fed entirely with modified milk.

No data were received from several important depots. The total number fed in 1910, as compared with 1909, can not therefore be stated. (See pages 171 to 175.)

Character of Distribution of Milk.

Twenty-six institutions dispensed the milk in individual feedings, five in ordinary bottles, one in both individual feedings and ordinary bottles, one in bulk and five in both individual packages and in bulk.

Thirty-one institutions furnish modified milk, some of them also furnishing whole milk, and seven furnish only whole milk.

The number of modifications vary in the several institutions from two to eighteen, and in some the number is dependent

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INSTITUTION	MILK DISTRIBUTED IN BULK OR IN INDIVIDUAL PACKAGES?	QUANTITY OF MILK DISTRIBUTED DURING PAST YEAR?	HOW MANY MODIFICATIONS OR MIXTURES OF MILK ARE FURNISHED?
Albany, N. Y.—Central Christian Mothers' Union.	Individual packages.	About 8,000 bottles.	Six.
Baltimore, Md.—The Babies' Milk Fund Association.	Both.	?	Six, and special can be ordered.
Council Milk and Ice Fund.	In quart bottles.	Fresh milk, about 33,200 quarts.	Six, as they may be prescribed.
Boston, Mass.—Women's Municipal League, Committee on Infant Social Service.	Both.	?	As many as are necessary.
Chicago, Ill.—Infant Welfare Society (formerly Milk Commission of Chicago).	Individual nursing bottles.	999,313 Bottles.	Seven.
Dayton, Ohio.—Milk Commission Montgomery County Medical Society Free Milk Fund.	Individual packages.	16,128 quarts.	No standard mixtures.
Detroit, Mich.—Detroit Milk Fund.	Individual packages.	?	To order.
Hartford, Conn.—Babies' Hospital, Inc.	.....	.....	.....

The American Association of Medical Milk Commissions

INSTITUTION	MILK DISTRIBUTED IN BULK- OR IN INDIVIDUAL PACK- AGES?	QUANTITY OF MILK DISTRIB- UTED DURING PAST YEAR?	HOW MANY MODIFICATIONS OR MIXTURES OF MILK ARE FURNISHED?
Honolulu, T. H.—Palama Settle- ment.	Individual packages.	?	8 standard; special to order.
Indianapolis, Ind.—Pure Milk Commission of the Children's Aid Association.	Individual packages.	4,810 gallons.	2,666.
Kansas City, Mo.—Kansas City Pure Milk Commission.	Individual containers, one feeding each.	About 175,000 feedings.	Three.
Lawrence, Mass.—Lawrence Sani- tary Milk Commission.	Individual packages.	About 1,000 quarts.	Five.
Louisville, Ky.—Babies' Milk Fund Association.	Individual packages.	Whole milk, 20,637 quarts, buttermilk 1,236 quarts.	5 stock; special as they are ordered.
Milwaukee, Wis.—Visiting Nurse Association, two summer day camps.	Individual packages.	.....	As they are ordered.
Newark, N. J.—The Babies' Hos- pital Milk Dispensary.	Individual feeding bottles.	240,000 bottles.	Six.
New Bedford, Mass.—The Char- ity Organization Society.	In quart and pint bottles.	6,630.	None.
New Haven, Conn.—Consumers' League, milk depot.	Individual packages.	36,870 quarts.	Four.

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INSTITUTION	MILK DISTRIBUTED IN BULK OR IN INDIVIDUAL PACKAGES?	QUANTITY OF MILK DISTRIBUTED DURING PAST YEAR?	HOW MANY MODIFICATIONS OR MIXTURES OF MILK ARE FURNISHED?
New York City.—Division of Child Hygiene, Department of Health.	Packages.	Not known.	Four.
Good Samaritan Dispensary.	Both.	35,515 quarts for children; 1,500 quarts for adults.	Eighteen.
Nathan Straus Laboratory.	Individual bottles.	2,804,238 bottles; 1,384,021 glasses.	Five.
New York Milk Committee.	Bottles.	About 68,580 quarts.	No set formulas.
Wilkes' Dispensary, Out-patient Department of St. Mary's Free Hospital for Children.	Individual bottles.	3,255 quarts.	None.
Peoria, Ill.—Associated Charities.	Both.	2,451 quarts.	None.
Philadelphia, Pa.—			
Pittsburgh, Pa.—Department of Health of the City of Pittsburgh.	Quart bottles.	71,053 quarts.	None.
Providence, R. I.—Providence District Nursing Association.	Individual packages.	354 gallons.	As may be ordered.
Rochester, N. Y.—Rochester Milk Depots.	Individual packages.	?	Four.

The American Association of Medical Milk Commissions

INSTITUTION	MILK DISTRIBUTED IN BULK OR IN INDIVIDUAL PACKAGES?	QUANTITY OF MILK DISTRIBUTED DURING PAST YEAR?	HOW MANY MODIFICATIONS OR MIXTURES OF MILK ARE FURNISHED?
St. Louis, Mo.—St. Louis Pure Milk Commission.	Individual packages.	729,648 bottles distributed in 1909, and 15,534 bottles barley water.	Three.
United Hebrew Charities.	In bottles, one feeding in each.	91,000 bottles, average size, five ounces.	Three.
Clinic for Infant Feeding, of St. Louis Children's Hospital.	Individual packages.	?	?
Kingdom House Feeding Clinic, Kingdom House Settlement.	Individual bottles, one feeding each.	83,000 bottles.	Three.
Springfield, Ohio.—Baby's Milk Dispensary.	Individual packages.	?	?
Washington, D. C.—Nathan Straus Pasteurized Milk Laboratory.	Individual feedings.	196,288 bottles in eight months.	Five, and whole milk.
Washington Diet Kitchen, with baby milk stations situated at Neighborhood House and Noel House.	Packages.	Diet kitchen, 14,989.25 quarts (?); milk stations, 7,539 quarts (?) about.	Five.
Instructive Visiting Nurse Society of the District of Columbia, Department of Prevention of Infant Mortality.	In bottles.	Not known.	Five, and whole milk.

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INSTITUTION.	MILK DISTRIBUTED IN BULK OR IN INDIVIDUAL PACKAGES?	QUANTITY OF MILK DISTRIBUTED DURING PAST YEAR?	HOW MANY MODIFICATIONS OR MIXTURES OF MILK ARE FURNISHED?
Waterbury, Conn.—Waterbury Visiting Nurse Association.	.....	.....	.....
Wilkes-Barre, Pa.—Wyoming Valley Society for the Prevention and Treatment of Tuberculosis.	Individual packages.	No record.	Six, and pasteurized whole milk.
Worcester, Mass.—Worcester Conference on Child Welfare.	Pinta.	11,429 quarts.	Whole milk only.
Boston, Mass.—Milk and Baby Hygiene Association.	Feeding bottles and pint and quart bottles.	About 102,781 quarts.	Three, and whole milk, fat-free milk, whey, and barley water.
Buffalo, N. Y.—Babies' Milk Dispensary of Buffalo.	Individual packages.	16,442 quarts.	Seven regular, besides special formulas.
Cleveland, Ohio.—The Babies' Dispensary and Hospital.	Mostly in bulk; some in individual packages.	32,610 gallons, including 20,921 gallons distributed in bulk to hospitals.	Prepared to order; no stock formulas used.
Yonkers, N. Y.—Saint John's Riverside Hospital.	Six or eight ounce bottles.	3,343 quarts, in three and one-half months.	Pure milk, milk and barley water, milk and plain water and barley water.
New York City.—New York Diet Kitchen Association.	In bulk.	614,058 quarts.	None.

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on the prescriptions of physicians. On the whole, it appears to be the practice to prepare the milk in accordance with standard formulæ, varying these only in response to the special needs of individual infants as indicated by physicians. (See pages 177 to 181.)

Treatment of Milk Dispensed.

The various modifications in the several institutions were intended to meet the needs of infants from birth to one year or eighteen months of age.

The replies received indicate that at fifteen institutions the milk is heated, at sixteen it is dispensed raw, and at three both heated and raw milk are used.

The temperatures employed for pasteurization varied in the different institutions from 140° F. to 170° F., and the time of heating varied from ten minutes to forty minutes. One depot only used a continuous flow pasteurizer, holding the milk to 170° for one minute. In the majority of depots, on the other hand, twenty minutes was the minimum time of exposure. (See pages 182 to 187.)

Heating of Milk in Summer and Winter.

At ten depots the milk was heated in summer and winter alike. In others, less heat was applied in winter, and some none at all.

At eleven institutions "Certified" Milk was used. The remaining twenty-six appear to have used the best milk obtainable. This, in some instances, was stated to be of the grade of "Certified Milk," though not certified.

Statistics as to Benefits Derived.

As in previous compilations, the figures contained in the last two columns are presented for what they are worth.

As a whole, the statistics of infant mortality in the several cities mentioned are incomparable, both because of the different methods used in determining the rates and because of the general incompleteness of the statistics on which such rates are based.

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INSTITUTION.	FOR WHAT AGES ARE MODIFICATIONS DESIGNED?	MILK HEATED OR USED RAW?	IF HEATED, TO WHAT TEMPERATURE, AND HOW LONG?
Albany, N. Y.—Central Christian Mothers' Union.	Two weeks to two years.	Raw.	.....
Baltimore, Md.—The Babies' Milk Fund Association.	.....	Pasteurized in summer.	145°, 40 min.
Council Milk and Ice Fund.	From new-born babies to eleven months.	Heated.	?
Boston, Mass.—Women's Municipal League, Committee on Infant Social Service.	Any age under one year.	Raw.	.....
Chicago, Ill.—Infant Welfare Society (formerly Milk Commission of Chicago).	Three weeks to sixteen months.	Pasteurized.	170°, continuous flow pasteurizer, held one minute.
Dayton, Ohio.—Milk Commission, Montgomery County Medical Society, Free Milk Fund.	.....	Raw.	.....
Detroit, Mich.—Detroit Milk Fund.	.....	As may be ordered.	As may be ordered.
Hartford, Conn.—Babies' Hospital, Inc.
Honolulu, T. H.—Palama Settlement.	From birth to fifteen months.	Raw.

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INSTITUTION.	FOR WHAT AGES ARE MODIFICATIONS DESIGNED?	MILK HEATED OR USED RAW?	IF HEATED, TO WHAT TEMPERATURE, AND HOW LONG?
Indianapolis, Ind.—Pure Milk Commission of the Children's Aid Association.	Chiefly for nursing babies.	Raw.	.....
Kansas City, Mo.—Kansas City Pure Milk Commission.	Birth to three months; three to eight months; eight months and over.	Heated.	165°, 20 min.
Lawrence, Mass.—Lawrence Sanitary Milk Commission.	Three months, six months, one year, two years, barley water (modified).	Raw.	.....
Louisville, Ky.—Babies' Milk Fund Association.	Stock mixtures from birth to twelve months.	Raw.	.....
Milwaukee, Wis.—Visiting Nurse Association, two summer day camps.	.....	.....	.....
Newark, N. J.—The Babies' Hospital Milk Dispensary.	Birth to three months; three to six months; six to nine months; nine to twelve months; full milk for second year; mixture for fever cases.	Heated.	155°, 20 min.
New Bedford, Mass.—The Charity Organization Society.	.....	Raw.	.....
New Haven, Conn.—Consumers' League, milk depot.	From birth to two years.	Modified.	Warmed before giving to child.

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INSTITUTION.	FOR WHAT AGES ARE MODIFICATIONS DESIGNED?	MILK HEATED OR USED RAW?	IF HEATED, TO WHAT TEMPERATURE, AND HOW LONG?
New York City.—Division of Child Hygiene, Department of Health.	Birth to three months; three to six months; six to nine months; nine to twelve months.	Pasteurized.	140° F.
Good Samaritan Dispensary.	One day to two years.	Both.	60° C., 20 min.
Nathan Straus Laboratory.	Two days to one year.	Heated.	155° F., 20 min.
New York Milk Committee.	.....	Raw.	.....
Wilkes' Dispensary, Out-patient Department of St. Mary's Free Hospital for Children.	.....	As may be directed.	.....
Peoria, Ill.—Associated Charities.	.....	.....	.....
Philadelphia, Pa.—			
Pittsburgh, Pa.—Department of Health of the City of Pittsburgh.	Under three months; three to six months; six to nine months; nine to twelve months.	Raw.	.....
Providence, R. I.—Providence District Nursing Association.	From birth to sixteen months.	Raw.	.....
Rochester, N. Y.—Rochester Milk Depots.	One month to one year.	Raw.	.....

The American Association of Medical Milk Commissions

INSTITUTION.	FOR WHAT AGES ARE MODIFICATIONS DESIGNED?	MILK HEATED OR USED RAW?	IF HEATED, TO WHAT TEMPERATURE, AND HOW LONG?
St. Louis, Mo.—St. Louis Pure Milk Commission.	Two to three months; three to seven months.	Pasteurized.	160° to 167° F., 20 min.
United Hebrew Charities.	First to fourth month; fifth to ninth month; over nine months.	Usually pasteurized.	160° F., 20 min.
Clinic for Infant Feeding of St. Louis Children's Hospital.	.....	.....	.....
Kingdom House Feeding Clinic, Kingdom House Settlement.	One week to fifteen months.	Heated.	160° F., 10 min.
Springfield, Ohio.—Baby's Milk Dispensary.	.....	Raw.	.....
Washington, D. C.—Nathan Straus Pasteurized Milk Laboratory.	One week to eleven months.	Heated.	150° F., 25 to 30 min.
Washington Diet Kitchen, with baby milk stations situated at Neighborhood House and Noel House.	Four weeks; one to three months; two to six months; three to seven months; seven to nine months.	Heated.	For babies, 150° for 20 minutes; for adults, 140° for twenty minutes.
Instructive Visiting Nurse Society of the District of Columbia, Department for the Prevention of Infant Mortality.	?	Heated.	140° to 150°, 20 minutes.

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INSTITUTION.	FOR WHAT AGES ARE MODIFICATIONS DESIGNED?	MILK HEATED OR USED RAW?	IF HEATED, TO WHAT TEMPERATURE, AND HOW LONG.
Waterbury, Conn. — Waterbury Visiting Nurse Association.	.....	.....	.....
Wilkes-Barre, Pa.—Wyoming Valley Society for the Prevention and Treatment of Tuberculosis.	One week to one month; three weeks to two months; two to six months; four to seven months; six to nine months; over nine months.	Heated.	
Worcester, Mass.—Worcester Conference on Child Welfare.	.....	Raw.	.....
Boston, Mass.—Milk and Baby Hygiene Association.	Under one month; one to four months; over four months.	Heated.	140°, 20 to 30 minutes.
Buffalo, N. Y.—Babies' Milk Dispensary of Buffalo.	Two years and under.	Raw.	.....
Cleveland, Ohio.—The Babies' Dispensary and Hospital.	.....	Raw.	.....
Yonkers, N. Y.—Saint John's Riverside Hospital.	.....	Heated.	165°, for 20 minutes.
New York City.—New York Diet Kitchen Association.	.....	.....	.....

The American Association of Medical Milk Commissions

INSTITUTION.	IS HEAT APPLIED SUMMER AND WINTER ALIKE?	WHAT GRADE OF MILK IS EMPLOYED?	MORTALITY RATE FOR INFANTS UNDER ONE YEAR OF AGE.	MORTALITY RATE AMONG CHILDREN FED ON DISPENSARY MILK ONE MONTH OR OVER DURING PAST YEAR.
Albany, N. Y.—Central Christian Mothers' Union.	.....	Certified.	17+ %.	6%.
Baltimore, Md.—The Babies' Milk Fund Association.	No.	Best.	Not known.	7 to 9%.
Council Milk and Ice Fund.	?	Best.	?	?
Boston Mass.—Women's Municipal League, Committee on Infant Social Service.	.....	Walker-Gordon.	In 1909, 26.87% in general.	2.58%, year ending April 10, under committee's care.
Chicago, Ill.—Infant Welfare Society (formerly Milk Commission of Chicago).	Yes.	Holstein, butter-fat, 4%.	?	No statistics available.
Dayton, Ohio.—Milk Commission, Montgomery County Medical Society, Free Milk Fund.	Certified.	?	5 out of 99.
Detroit, Mich.—Detroit Milk Fund.	?	Best.	?	?

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INSTITUTION.	IS HEAT APPLIED SUMMER AND WINTER ALIKE?	WHAT GRADE OF MILK IS EMPLOYED?	MORTALITY RATE FOR INFANTS UNDER ONE YEAR OF AGE.	MORTALITY RATE AMONG CHILDREN FED ON DISPENSARY MILK ONE MONTH OR OVER DURING PAST YEAR.
Hartford, Conn.—Babies' Hospital, Inc.	.....	.....	.....	.....
Honolulu, T. H.—Palama Settlement.	.....	Best obtainable.	273 per 1,000.	14 per 1,000.
Indianapolis, Ind.—Pure Milk Commission of the Children's Aid Association.	.....	High grade, tested.	12.5%.	11 out of 324.
Kansas City, Mo.—Kansas City Pure Milk Commission.	Yes.	Best obtainable.	About 20%.	Not known.
Lawrence, Mass.—Lawrence Sanitary Milk Commission.	.....	Very good, bacterial count averaging 10,000.	About 15% of children under one year.	None died.
Louisville, Ky.—Babies' Milk Fund Association.	.....	Certified.	15.9% average last 5 years.	1.07%.
Milwaukee, Wis.—Visiting Nurse Association, two summer day camps.	.....	.....	.....	.....
Newark, N. J.—The Babies' Hospital Milk Dispensary.	Yes.	Grade of certified (not certified).	18.31% of total deaths.	2.5%.

The American Association of Medical Milk Commissions

INSTITUTION.	IS HEAT APPLIED SUMMER AND WINTER ALIKE?	WHAT GRADE OF MILK IS EMPLOYED?	MORTALITY RATE FOR INFANTS UNDER ONE YEAR OF AGE.	MORTALITY RATE AMONG CHILDREN FED ON DISPENSARY MILK ONE MONTH OR OVER DURING PAST YEAR.
New Bedford, Mass.—The Charity Organization Society.	.....	Best obtainable.	34.2 in 1909.	17.
New Haven, Conn.—Consumers' League, milk depot.	.....	Best, from a model dairy.	?	?
New York City.—Division of Child Hygiene, Department of Health.	Yes.	Conforming to requirements of Sanitary Code.	134 per 1,000.	Not known.
Good Samaritan Dispensary.	Summer, 75° to 80°.	Borden's best.	.....	10.
Nathan Straus Laboratory.	Yes.	Certified.	134 per 1,000.	1.7%.
New York Milk Committee.	.....	Of the grade of "certified."	.....	6.45%.
Wilkes' Dispensary, Out-patient Dept. of St. Mary's Free Hospital for Children.	Certified.
Peoria, Ill.—Associated Charities.

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Philadelphia, Pa.— Pittsburgh, Pa.—Department of Health of the City of Pittsburgh.	Certified.	Per 10,000 inhabitants for 1910, 42.46.	23 out of 1,207.
Providence, R. I.—Providence District Nursing Association.	From dairies recommended by milk inspector.	20, 87% of the total number of deaths.	Not known.
Rochester, N. Y.—Rochester Milk Depots.	Market milk.	13.8 per 1,000.	Less than 3%.
St. Louis, Mo.—St. Louis Pure Milk Commission.	Yes.	Certified.		Not known.
United Hebrew Charities.	Milk not pasteurised when temperature is less than 40°.	Certified.	?	Not known.
Clinic for Infant Feeding of St. Louis Children's Hospital.

The American Association of Medical Milk Commissions

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St. Louis, Mo.—Kingdom House Feeding Clinic, Kingdom House Settlement.	Less heat during winter	Certified.	30%.	20%.
Springfield, Ohio.—Baby's Milk Dispensary.	.....	From registered Jersey cows.	?	6%.
Washington, D. C.—Nathan Straus Pasteurized Milk Laboratory.	Yes.	Corresponding to certified milk.	15.2% (basis births during year).	6% for 8 mos. May 1st to Dec. 31st, 1910.
Washington Diet Kitchen, with baby milk stations situated at Neighborhood House and Noel House.	Yes.	First grade.	170.32 to 1,000.	6% for 6 mos. during the summer.
Instructive Visiting Nurse Society of the District of Columbia, Department for the Prevention of Infant Mortality.	Yes.	First grade.	170.32 to 1,000.	Unable to state.
Waterbury, Conn.—Waterbury Visiting Nurse Association.

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Wilkes-Barre, Pa.—Wyoming Valley Society for the Prevention and Treatment of Tuberculosis.	Best obtainable.
Worcester, Mass.—Worcester Conference on Child Welfare.	.....	Inspected.	11.8% (1909).	4% (1910).
Boston, Mass.—Milk and Baby Hygiene Association.	Yes.	Inspected from tuberculin-tested cattle.	About 12%.	About 5.77%.
Buffalo, N. Y.—Babies' Milk Dispensary of Buffalo.	.....	Certified; examined by bacteriologist every week.	22% of total deaths.	3⅓%.
Cleveland, Ohio.—The Babies' Dispensary and Hospital.	From first May.	Tested, from tuberculin-tested cattle.	15%.	7.6%.
Yonkers, N. Y.—Saint John's Riverside Hospital.	Open only during summer.	Canned milk.	.....	.....
New York City.—New York Diet Kitchen Association.	.....	75% certified; 25% ordinary.	134 in 1,000.	.....

The American Association of Medical Milk Commissions

The correct infant mortality rate is the ratio of deaths of infants under one year of age to the number of children born alive during the year. In the absence of registration of births in many cities, therefore, no such rate can be determined, and since registration of births in the great majority of cities is very incomplete, any ratio based upon the returns would be misleading.

The data presented indicate how desirable it would be to know the correct infant mortality rate, and emphasize in some measure the importance of the accurate registration of both births and deaths.

The small number of deaths among children fed on dispensary milk one month or over, shows the value of such work among those children, and especially when it is borne in mind that the majority of the children were sick when application was first made for milk. As to the relative importance of the educational work as compared with the dispensing of proper milk, this can only be conjectured. But the two together would appear to accomplish results which could not be expected of either one alone.

Ben Carlos Frazier, M. D.: "In the name of Louisville, Ky., I would like to say that we wish to see all the gentlemen here in Louisville next year, and we want to show you what our town can do, although this has been splendid. The ladies of course are invited."

On motion of Dr. Henry L. Coit, seconded, the meeting was adjourned.

Proceedings of the Fifth Annual Conference

**List of Medical Milk Commissions in the
United States and Canada.**

CALIFORNIA.

Milk Commission of the Alameda Co. Medical Society, Oakland.

President, Thomas C. McCleave, Berkeley National Bank Building,
Berkeley.

Secretary, Sarah I. Shuey, 952 Fourteenth Street, Oakland.

Milk Commission of the Los Angeles Co. Medical Society, Pasadena.

President, Fitch C. E. Mattison, Chamber of Commerce Building, Pasadena.

Secretary, George H. Kress, Bradbury Building, Los Angeles.

Milk Commission of the San Francisco Co. Medical Society, San Francisco.

President, Lewis Sayre Mace, Schroth Building.

Secretary, Adelaide Brown, 2520 Sacramento Street.

COLORADO.

Milk Commission of the El Paso Co. Medical Society, Colorado Springs.

President, C. F. Gardiner, 818 North Cascade Avenue.

CONNECTICUT.

Milk Commission of the Bridgeport Medical Association, Bridgeport.

Secretary, F. L. Day, 475 State Street.

Milk Commission of the Greenwich Medical Society, Greenwich.

Chairman, A. W. Klein.

Secretary, Edward Parker, Putman Avenue.

Milk Commission of the Hartford Co. Medical Society, Hartford.

Secretary, Walter G. Murphy, 75 Pratt St.

FLORIDA.

Duval Co. Medical Milk Commission, Jacksonville.

Chairman, James V. Freeman, 225 West Forsyth Street.

Secretary, William Edson Ross, 43 Ashley Street.

The American Association of Medical Milk Commissions

ILLINOIS.

Milk Commission of the Chicago Medical Society, Chicago.

President, Charles S. Bacon, 2156 Sedgwick Street.

Secretary, J. W. Van Derslice, 155 North Sixty-fourth Street, Oak Park, Illinois.

Milk Commission of Galesburg.

Chairman, Ben D. Baird, Main Street.

Secretary, E. N. Nash.

Milk Commission of the Galva District Medical Society, Kewanee.

President, H. N. Heflin.

KENTUCKY.

Milk Commission of the Jefferson Co. Medical Society, Louisville.

President, Cuthbert Thompson, Third and Broadway.

Secretary, Ben Carlos Frazier, Atherton Building.

Milk Commission of the Fayette Co. Medical Association, Lexington.

Chairman, R. J. Estill.

Secretary, D. Woolfolk Barrow, 148 Market Street.

LOUISIANA.

Milk Commission of the New Orleans Pure Milk Society, New Orleans.

President, W. W. Butterworth.

Vice-President, I. I. Lemann.

Secretary, Robert H. Polack.

MASSACHUSETTS.

The New Bedford Medical Milk Commission, New Bedford.

Chairman, Charles Pratt.

Secretary, William A. Nield, 62 Fifth Street.

Milk Commission of the Suffolk District Medical Society, Boston.

Chairman, James Marsh Jackson, 230 Beacon Street.

Secretary, Richard M. Smith, 222 Marlborough Street.

Milk Commission of the Cambridge Medical Improvement Society, Cambridge.

President, William D. Swan, 167 Brattle Street.

Secretary, Albert P. Norris, 760 Massachusetts Avenue.

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Milk Commission of the Malden Medical Society, Malden.

President, A. J. Stevens, 539 Main Street.

Secretary, E. W. Barron.

Medical Milk Commission of Worcester, Worcester.

President, Charles L. Nichols, 38 Cedar Street.

Secretary, R. J. Ward, 397 Pleasant Street.

MICHIGAN.

Milk Commission of the Wayne County Medical Society, Detroit.

Chairman, R. S. Rowland, 512 Washington Arcade.

Secretary, T. B. Cooley, Fine Arts Building.

Milk Commission of the Kent Co. Medical Society, Grand Rapids.

Chairman, G. McBride, 257 East Fulton Street.

Secretary, William H. Veenboer, 504 Ashton Building.

Milk Commission of the Jackson Co. Medical Society, Jackson.

Chairman, W. A. Gibson.

Secretary, W. H. Enders, Jackson State Savings Bank Building.

MINNESOTA.

Milk Commission of the Hennepin Medical Society, Minneapolis.

Chairman, J. P. Sedgwick.

Secretary, Robert Williams.

MISSOURI.

Kansas City Pure Milk Commission, Kansas City.

Chairman, George C. Mosher, 605 Bryant Building.

Secretary, D. E. Broderick.

St. Louis Pure Milk Commission, St. Louis.

Secretary, H. E. Mortland, 2221 Locust Street.

NEW JERSEY.

Union County Medical Milk Commission, Elizabeth.

President, William H. Murray, Plainfield.

Secretary, Arthur Stern, 224 East Jersey Street, Elizabeth.

Milk Commission of the Hudson Co. Medical Society.

President, J. A. Exton, 75 Beech Street, Arlington.

Secretary, S. A. Cosgrove, 757 Ocean Avenue, Jersey City.

The American Association of Medical Milk Commissions

Milk Commission of Morris Co. Medical Society, Morristown.

President, F. H. Glazebrook, Morristown.

Secretary, T. W. Bebout, Stirling.

Milk Commission of Essex Co., Newark. [The first Medical Milk Commission].

Chairman, Henry L. Coit, 277 Mt. Prospect Avenue.

Secretary, Floy McEwen, 299 Belleville Avenue.

Milk Commission of the Passaic Co. Medical Society, Paterson.

President, Francis H. Todd, 218 Broadway.

Secretary, G. Edward Tuers, 12 Church Street.

Milk Commission of Union Co., No. 3.

President, Eliot Gorton, Summit.

Secretary, David E. English, 309 Springfield Avenue, Summit.

NEW YORK.

Milk Committee of the Medical Society of County of Albany, Albany.

President, James P. Boyd, 152 Washington Avenue.

Secretary, Henry L. K. Shaw, 361 State Street.

Milk Commission of the Broome Co. Medical Society, Binghamton

President, Le Roy D. Farnham, 42 Main Street.

Milk Commission of the Medical Society, County of Kings, Brooklyn.

Chairman, William P. Northridge, 21 Hanson Street.

Secretary, Walter D. Ludlum, 362 Marlboro Road.

Milk Commission of the Erie Co. Medical Society, Buffalo.

Chairman, C. Sumner Jones, 695 Delaware Avenue.

Milk Commission of the Elmira Academy of Medicine, Elmira.

President, C. W. M. Brown, 100 West Church Street.

Secretary, Ross G. Loop, 54 South Main Street.

The New York Medical Milk Commission, New York City.

Secretary, J. H. Huddleston, 145 West Seventy-eighth Street.

Milk Commission of the Medical Society of Co. of New York, New York City.

President, E. K. Dunham, 35 East Sixty-eighth Street.

Secretary, Rowland G. Freeman, 211 West Fifty-seventh Street.

Milk Commission of the Medical Society of the County of Dutchess, Poughkeepsie.

President, John S. Wilson.

Secretary, A. L. Peckham.

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Milk Commission of the Monroe Co. Medical Society, Rochester.

President, Richard M. Moore, 74 South Fitzhugh Street.

Secretary, J. R. Williams, 290 Monroe Street.

The Westchester County Milk Commission, New Rochelle.

R. Condit Eddy, 125 Centre Avenue.

Milk Commission of the Onondago Medical Society, Syracuse.

President A. Clifford Mercer, 324 Montgomery Street.

Secretary, A. S. Hotaling, 801 East Genesee Street.

OHIO.

Milk Commission of the Academy of Medicine, Cincinnati.

Chairman, Alfred Friedlander, 4 West Seventh Avenue.

Secretary, Otto P. Geier, 124 Garfield Place.

Milk Commission of the City of Cleveland.

President, Samuel Mather, 1265 Euclid Ave.

Secretary, J. J. Thomas, 1110 Euclid Avenue.

Milk Commission of the Academy of Medicine, Columbus.

President, Ernst Scott, Clintonville.

Secretary, George C. Schaeffer, 112 East Broad St., Columbus.

Milk Commission of the Montgomery Co. Medical Society, Dayton.

President, C. W. King, 223 North Main Street.

Secretary, A. L. Light, 1000 U. B. Building.

Milk Commission of the Academy of Medicine, Toledo.

President, Charles C. Chapman, 1708 Madison Avenue.

Secretary, Charles W. Moots, The Nicholas.

PENNSYLVANIA.

Milk Commission of the Pediatric Society, Philadelphia.

Chairman, Samuel McC. Hamill, 1822 Spruce Street.

Secretary, Arthur Newlin, 1804 Pine Street.

Milk Commission of Erie County Medical Society.

Chairman, Fred E. Ross, 2012 Peach St., Erie.

Secretary, C. G. Strickland, 151 W. 7th St., Erie.

Milk Commission of the Allegheny Co. Medical Society, Pittsburgh.

Chairman, Ogden M. Edwards, Jr., 5607 Fifth Avenue.

Corresponding Secretary, C. C. Wholey, 201 South Craig St.

The American Association of Medical Milk Commissions

TENNESSEE.

Milk Commission of Nashville.

Chairman, O. H. Wilson, 142 Seventh Avenue.

WASHINGTON.

Milk Commission of the Sanitary Department, Seattle.

Chairman, Phillip von Phul, Alaska Building.

Secretary, William G. Booth, Alaska Building.

WEST VIRGINIA.

Certified Milk Commission, Wheeling.

President, Robert J. Reed.

Secretary, William Hay McLain.

WISCONSIN.

Milk Commission of the Medical Society, Milwaukee.

Chairman, A. W. Gray, 514 Goldsmith Building.

Secretary, W. T. McNaughton, 208 Stephenson Building.

CANADA.

Milk Commission of the Academy of Medicine, Toronto, Ontario.

President, Henry Machell, 95 Bellevue Avenue.

Secretary, W. L. T. Addison, 431 Broadview Avenue.

Milk Commission of the Medical Society, Hamilton, Ontario.

Secretary, W. M. Carrick, 119 Main Street, East.

INDIVIDUAL MEMBERS NOT MEMBERS OF MEDICAL MILK COMMISSIONS.

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Brown, J. H.Montclair, N. J.
Bracken, H. M.Capital Bld'g, St. Paul, Minn.
Christman, H. A23 School Lane, Ardmore, Pa.
Churchill, F. S.1259 North State St., Chicago, Ill.
Evans, J. S., Jr.25 Mendola Court, Madison, Wis.
Evans, W. A.103 State Street, Chicago, Ill.
Eisenmann, F. S.22 East Main Street, Louisville, Ky.
Frost, W. D.University of Wisconsin, Madison, Wis.
Harding, H. A.N. Y. Experiment Station, Geneva, N. Y.

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Hastings, E. G.	University of Wisconsin, Madison, Wis.
Hegner, C. F.	628 Elm Street, Cincinnati, O.
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Keator, Bruce	Board of Health, Trenton, N. J.
Kerr, John W.	U. S. P. H. & M. H. S., Washington, D. C.
Knox, J. H. Mason	Cathedral Street, Baltimore, Md.
Lane, C. B.	Supplee Dairy Co., Philadelphia, Pa.
Maguire, G. W.	State House, Trenton, N. J.
Mitchell, Henry	Trenton, N. J.
Mules, J. H.	Auburn, California.
Norgaard, Victor A.	Honolulu, Hawaii.
North, Charles E.	Times Building, New York City.
Pearson, R. A.	Commissioner of Agriculture, Albany, N. Y.
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Sutphen, T. Y.	997 Broad Street, Newark, N. J.
Van Slyke, L. L.	N. Y. Experiment Station, Geneva, N. Y.
Ward, A. R.	Manila, Philippine Islands.
Webster, E. H.	Kansas Agricultural College, Manhattan, Kansas.
Wesbrook, F. F.	University of Minnesota, Minneapolis, Minn.
Winslow, Kenelm	Empire Bld'g, Seattle, Wash.

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